

SHARP

59-CS03H

MODEL

SERVICE MANUAL

ELECTRICAL SPECIFICATIONS

● Power Input.....220-240 VAC 50Hz

● Power Consumption (at 240 VAC)

Normal operating.....130 Wmax.
Stand-by Operating..... 3Wmax.

● Audio Power

Output Rating.....10W(MPO)x2
Speaker.....6cm. x 13 cm. (elliptic)
Voice coil impedance.....8 ohms

● Convergence.....Self Converging System

Focus.....Bi-Potencial Electrostatic
Sweep.....Magnetic

● White Level

Set brightness control to get total picture tube cathode current of 600 microampere under no signal condition. Maximum necessary correction of each picture tube cathode current to get 8900 degrees K-20MPCD screen temperature should not exceed 15% of its original value.

X=0.290 Y=0.284

● Intermediate Frequencies

Picture IF Frequency 39.5MHz
Sound IF Carrier Frequency
Stereo Nicam.....32.948MHz
FM Mono 33.05MHz
Colour Sub-Carrier
Frequency.....35.06 MHz (Nominal)

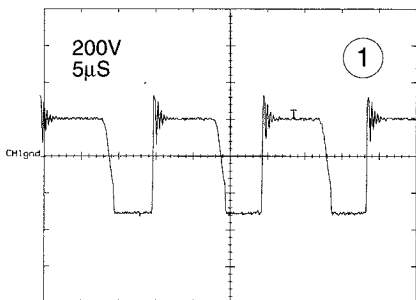
● Aerial Input Impedance

UHF 75 ohm Unbalanced
Tuning Ranges 471.25MHz to 855.25MHz

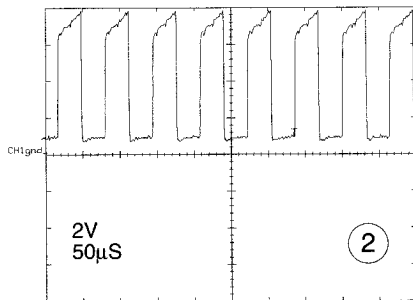
Specifications are subject to change without prior notice

OSCILOSCOPE WAVE FORM

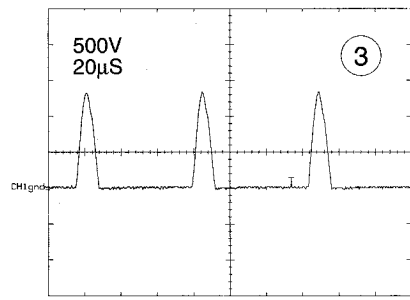
CH1 200V A 5ms -506 V VERT



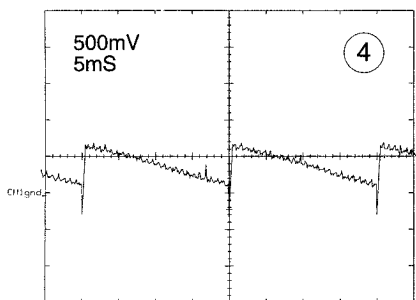
CH1 2V A 50ns 1.88 V VERT



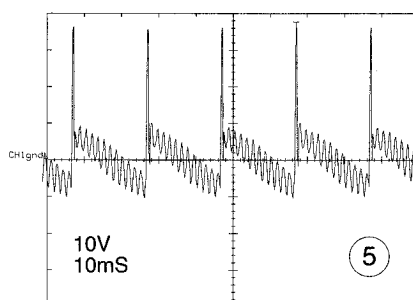
CH1 500V A 20ns -506 V VERT



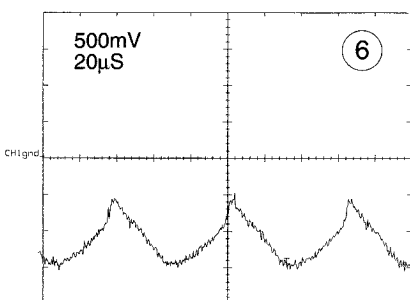
CH1 500mV A 5ms -256 V VERT



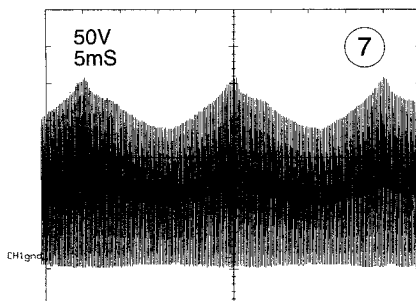
CH1 10V A 10ms 25.9 V VERT



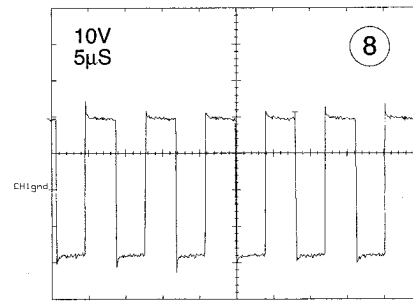
CH1 500mV A 20ns -1.56 V VERT



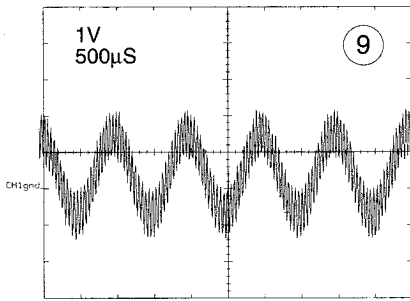
CH1 50V A 5ms 311mV CH2



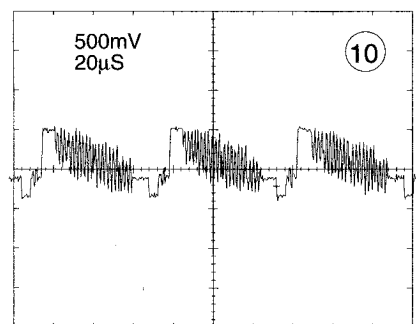
CH1 10V A 5ms 180 V VERT



CH1 1V A 500ns 8.20 V VERT



CH1 500mV A 20ns TVLN



NOTE:

Wave forms are obtained with
a colour bar signal of 79dB/μV via antenna.

SERVICE ADJUSTMENTS

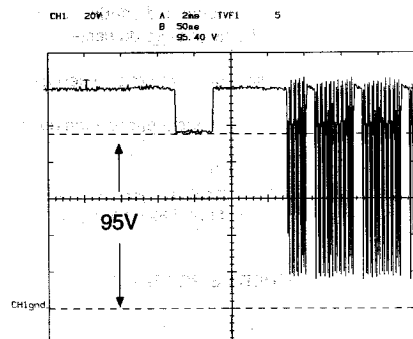
All the adjustments required for this chassis will be done in **Service Mode**, except G2.

G2 ADJUSTMENT

1. Receive cross hatch pattern signal.
2. Connect the oscilloscope to the red cathode and adjust G2 to read **95V** on the sensor pulse as in below drawing:

NOTE:

Oscilloscope should be adjusted for vertical TV field trigger and synchronized with video signal.



In order to use the Service Mode

- Connect Test Pattern signal to antenna terminal.
 - Press main switch to OFF.
 - Press ∇ and CH $\wedge$ buttons and main switch to ON simultaneously.
 - Service mode is now entered.
- To exit from service mode, press main switch to off.

The required adjustments can then be made from the Remote Control Unit.

The only buttons required are the following:

$\wedge$ CH ∇ for movement in adjustment options menu; $\wedge$ ∇ are used to carry out an adjustment and POWER button to memorize or to start a new adjustment.

Adjustment menus are as follows:

- SERVICE SOFTWARE
- AGC TAKE OVER POINT
- HORIZONTAL SHIFT
- EAST-WEST WIDTH
- EAST-WEST PARABOLA
- EAST-WEST CORNER
- EAST-WEST TRAPEZOID
- VERTICAL SLOPE
- VERTICAL AMPLITUDE
- S CORRECTION
- VERTICAL SHIFT
- RED REFERENCE
- GREEN REFERENCE
- BLUE REFERENCE
- ALTER NVM POS
- ALTER NVM VAL
- IF PLL ADJUSTAMENT
- TELETEX MIX MODE CONTRAST
- TELETEX CONTRAST
- OSD CONSTRAST
- AUTOINSTALLATION ON/OFF

Service Mode adjustments:

AGC TAKE OVER POINT

1. Receive colour bar signal (signal strength: 57dB/uV+/-1dB), the frequency should be chosen in the center of tuner band.
2. Press power button. The TV will perform an automatic adjustment.
3. To exit service mode turn off by main switch button on tv.

IF PLL ADJUSTMENT

1. Receive colour bar signal, CH69(855.25 MHz).
2. Press POWER button in remote control. The TV will perform an automatic adjustment.
3. Turn off by main switch to exit from service mode.

GEOMETRY ADJUSTMENT PROCEDURE:

The procedure for making adjustments to Vertical Corrections is as follows:

- Adjust VERT. SLOPE.
- Adjust S CORRECTION.
- Adjust VERT. SHIFT.
- Adjust VERT. AMPLITUDE.

The procedure for making adjustments to Horizontal Corrections is as follows:

- Set E-W WIDTH to minimum.
- Adjust HORIZONTAL SHIFT.
- Adjust E-W PARABOLA.
- Adjust E-W WIDTH.
- Adjust E-W TRAPEZOID.
- Adjust E-W CORNER.

VERTICAL SLOPE

- a) Receive center cross chart from pattern generator.
- b) Adjust horizontal line of the cross figure to coincide with the edge of the black area in the center of TRC. (fig. 1).

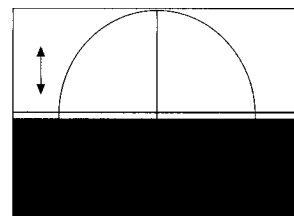


Fig. 1

HORIZONTAL SHIFT

- a) Receive Philips pattern signal.
- b) When volume-up button is pressed, picture moves to the left.
- c) When volume-down button is pressed, picture moves to the right.
- d) Adjust the horizontal location to obtain picture centering (fig. 2).

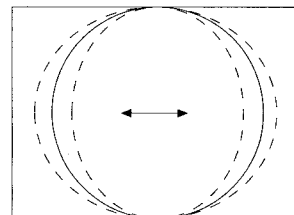


Fig. 2

E-W WIDTH

- a) Receive Philips pattern signal.
- b) When volume-up button is pressed, horizontal scanning increases.
- c) When volume-down button is pressed, horizontal scanning decreases.
- d) Adjust the horizontal amplitude to obtain 9% overscan (fig. 3).

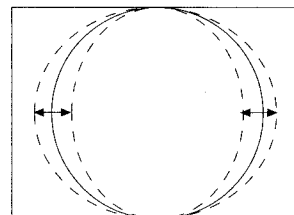


Fig. 3

E-W PARABOLA

- Receive Philips pattern signal.
- When volume-up button is pressed, side pincushion changes from pincushion shape.
- When volume-down button is pressed, side pincushion changes from barrel shape.
- Adjust the E-W PARABOLA to obtain condition as (fig. 4).

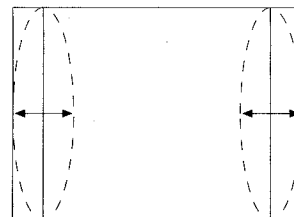


Fig. 4

E-W CORNER

- Receive Philips pattern signal.
- When volume-down button is pressed, side pincushion changes from pincushion shape.
- When volume-up button is pressed, side pincushion changes from barrel to pincushion shape.
- Adjust the E-W CORNER to obtain condition as in (fig. 5).

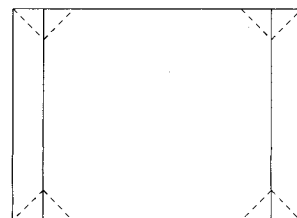


Fig. 5

E-W TRAPEZOID

- Receive Philips pattern signal.
- When volume-up button is pressed, side pincushion changes.
- When volume-down is pressed, side pincushion changes.
- Adjust the E-W TRAPEZOID to obtain condition as in (fig. 6).

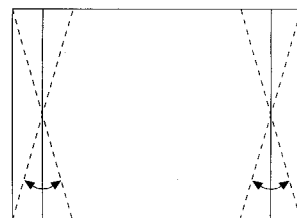


Fig. 6

VERTICAL SHIFT

- Receive Philips pattern signal.
- When volume-up button is pressed, picture moves down.
- When volume-down button is pressed, picture move up.
- Adjust the Vertical location to obtain picture centering (fig. 7).

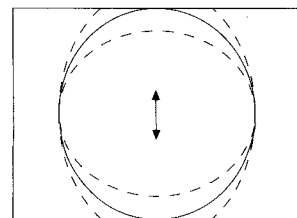


Fig. 7

VERTICAL AMPLITUDE

- Receive Philips pattern signal.
- When volume-up button is pressed, vertical size of picture increases.
- When volume-down button is pressed, vertical size of picture decreases.
- Adjust the vertical size to obtain overscan (fig. 8).

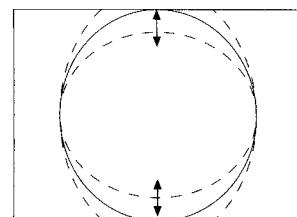


Fig. 8

S CORRECTION

- Receive Philips pattern signal.
- When volume-up button is pressed, upper and lower scanning decrease and centre scanning increases.
- When volume-down button is pressed, upper and lower scanning increase and centre scanning decreases.
- Adjust the S CORRECTION to obtain a balance between upper, lower and centre (fig. 9).

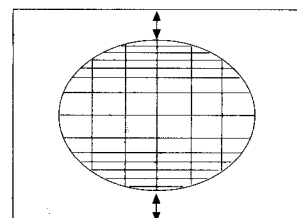


Fig. 9

COLOUR ADJUSTMENTS

The following adjustments are only required when Picture Tube is changed.

1. RED REFERENCE / GREEN REFERENCE / BLUE REFERENCE

1.1 Adjusts G2.

1.2 Tune a white card.

1.3 Adjust colour to minimum.

1.4 Place colourmeter in the center of screen.

1.5 Using brightness and contrast buttons, select a luminance of 120NITS.

1.6 Operating in Service Mode select with $\wedge$ CH $\vee$ the location RED REFERENCE, GREEN REFERENCE or BLUE REFERENCE and with $\wedge$ $\triangle$ $\vee$ adjust to obtain the specific value of X and Y.

1.7 Exit Service Mode by switching off the MAIN POWER.

NOTE:

Red must not be modified.

Increase of GREEN will decrease "Y".

Increase of BLUE will decrease both "X" and "Y".

ACCESS TO NVM

Press CH $\wedge$ to move in the following sequence: "Y"

ALTER NVM POS

CH $\wedge$



ALTER NVM VAL

To alter a valve press $\wedge$ $\triangle$ $\vee$

CONTRAST ADJUSTMENT

$\wedge$ $\triangle$ $\vee$ is used to adjust the contrast of the following items, TELETEXT MIX MODE CONTRAST, TELETEXT CONTRAST and OSD CONTRAST.

AUTO INSTALLATION OFF/ON

When ON is selected the TV will perform the autoinstallation sequence as soon as service mode is removed.

SERVICE MANUAL

ADDITIONAL NOTES

G2 Adjustment.

In the event that an oscilloscope is not available the following procedure will give a satisfactory way to adjust G2.

- 1 Tune the CTV to a broadcast.
- 2 Set the G2 to maximum and then reduce it just to extinguish the flyback lines .
- 3 Reduce the colour saturation to zero.
- 4 Reduce the contrast to minimum.
- 5 Reduce the brightness until the picture is just visible
- 6 Place a voltmeter on the RED cathode and adjust G2 to read 110V $\pm$ 3 V.
- 7 Return the contrast , brightness and colour to normal and check the picture visually.

Grey Scale Adjustment

In the event that a colourmeter is not available , the following procedure will give a satisfactory grey scale adjustment.

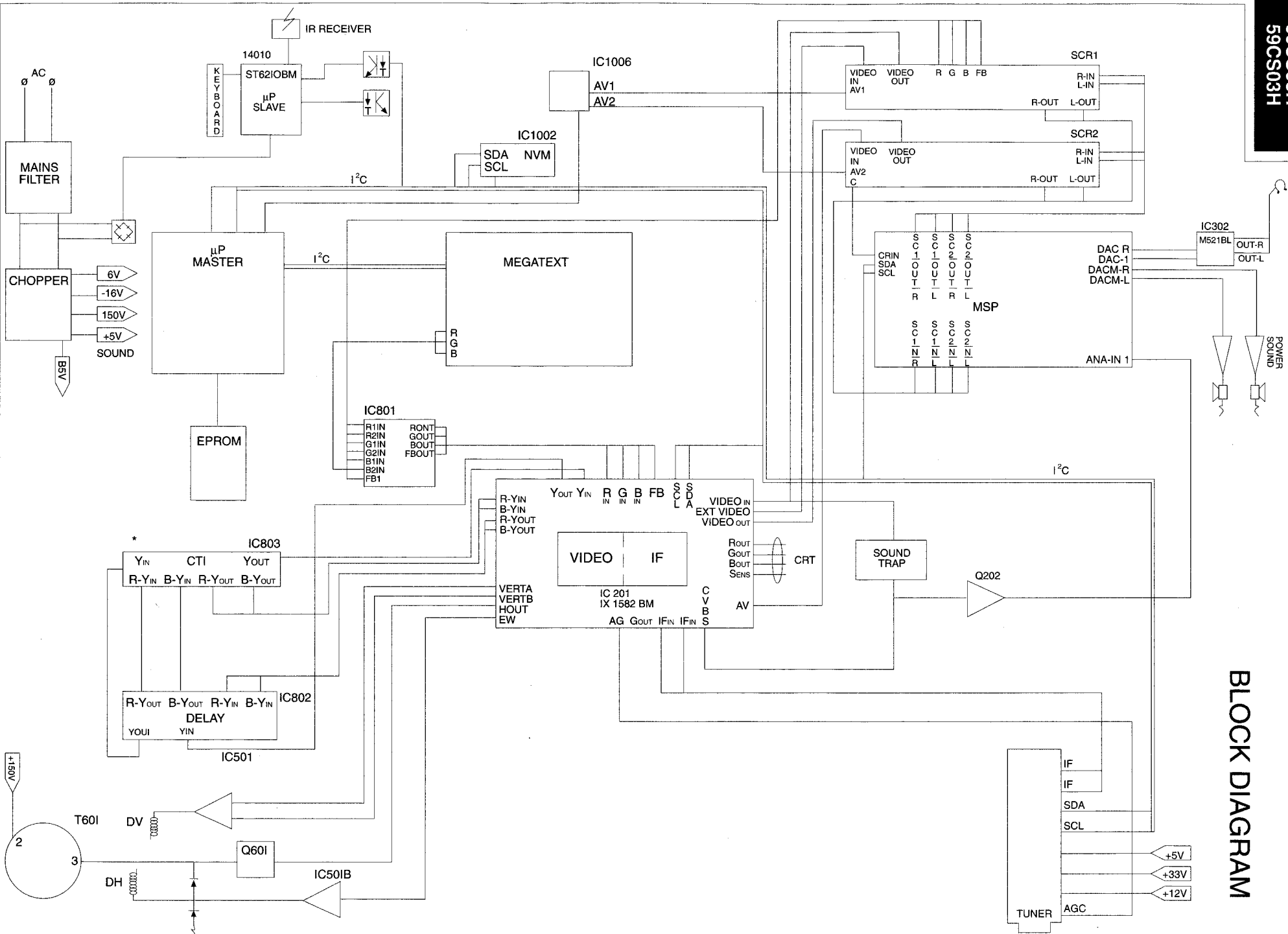
- 1 Adjust TINT control for centre position and reduce the colour saturation to zero before entering the SERVICE MODE .
- 2 Place the CTV in SERVICE MODE . Instructions for this are given on page 4 of the SERVICE MANUAL
- 3 Select the GREEN reference and adjust to 2C.
- 4 Select the BLUE reference and adjust to 2C.
- 5 From this starting position adjust the GREEN and BLUE reference until a satisfactory grey scale is obtained.

Note:

RED reference should not be adjusted , it should be left at 32

- 6 Store the new values and exit the service mode by switching OFF
-

BLOCK DIAGRAM

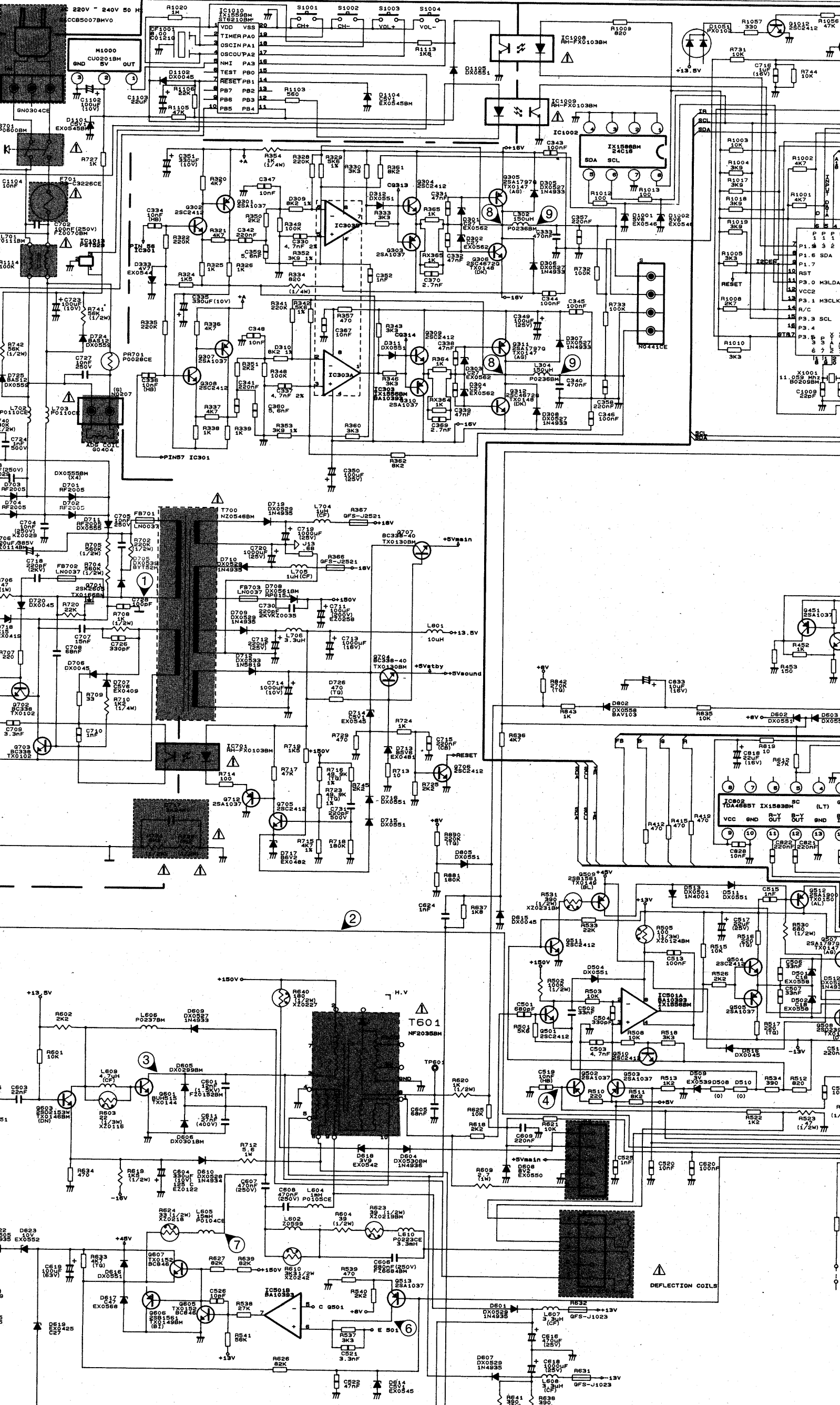


NVM Position List for Sharp Models 59CS03H and 66CS03H

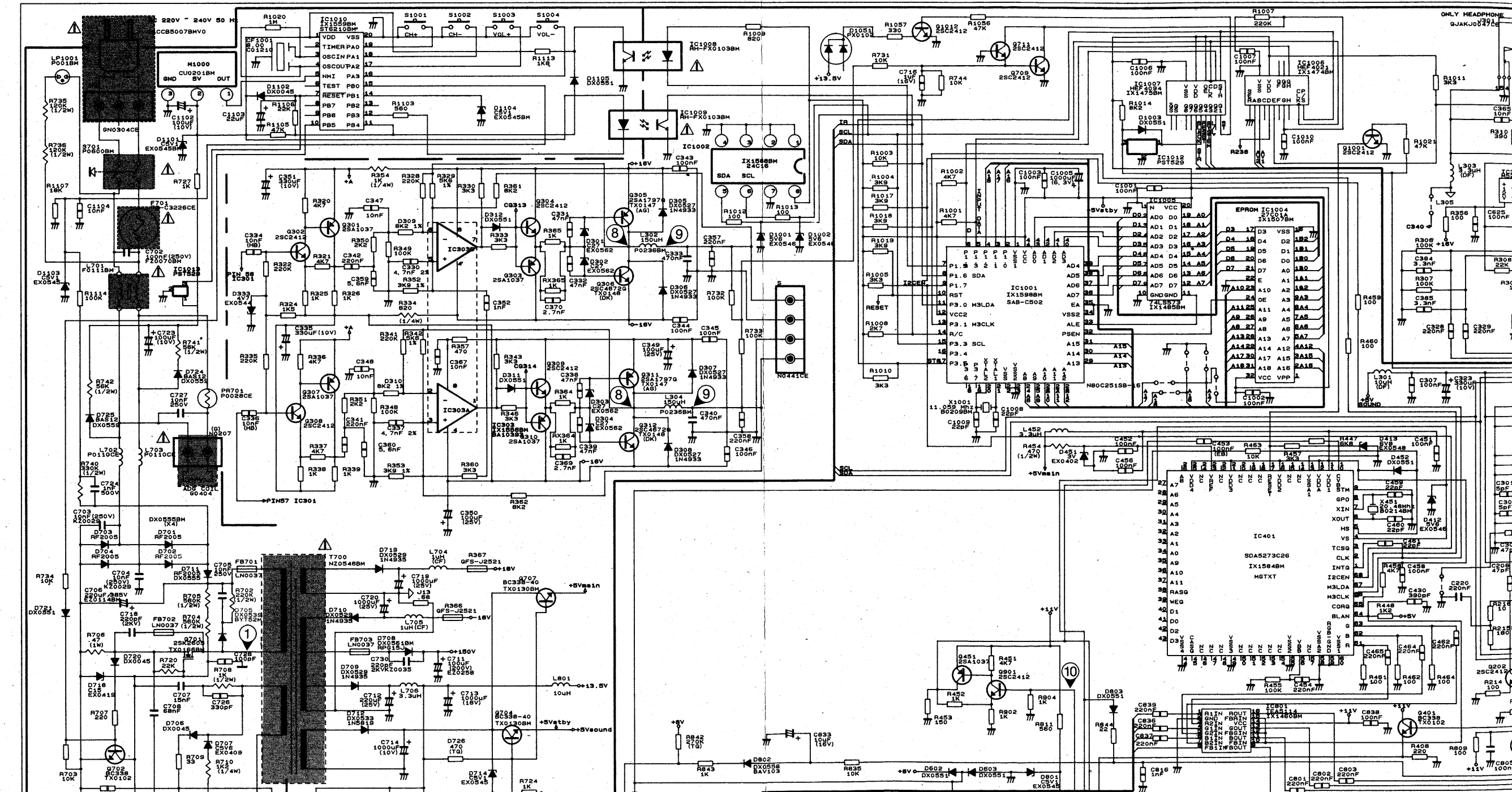
00H	OLD_AUDIO_FREE_00	000h		24H	HUE_NOR	32H	Normalised hue
01H	OLD_AUDIO_FREE_01	000h		25H	H_SHIFT_50Hz	17H	Horizontal shift 50Hz
02H	OLD_AUDIO_FREE_02	000h		26H	EW_AMP_50Hz	58H	East/West amplitude 50Hz
03H	OLD_AUDIO_FREE_03	000h		27H	EW_PAR_50Hz	40H	East/West parabola 50Hz
04H	OLD_AUDIO_FREE_04	000h		28H	EW_COR_50Hz	4AH	East/West corner 50Hz
05H	OLD_AUDIO_FREE_05	000h		29H	EW_TRA_50Hz	32H	East/West trapezium 50Hz
06H	OLD_AUDIO_FREE_06	000h		2AH	V_SLOPE_50Hz	32H	Vertical slope 50Hz
07H	OLD_AUDIO_FREE_07	000h		2BH	V_AMP_50Hz	21H	Vertical amplitude 50Hz
08H	OLD_AUDIO_FREE_08	000h		2CH	S_CORR_50Hz	1FH	S-Correction 50Hz
09H	OLD_AUDIO_FREE_09	008h		2DH	V_SHIFT_50Hz	33H	Vertical shift 50Hz
0AH	OLD_AUDIO_FREE_0A	000h		2EH	H_SHIFT_60Hz	1BH	Horizontal shift 60Hz
0BH	OLD_AUDIO_FREE_0B	033h		2FH	EW_AMP_60Hz	63H	East/West amplitude 60Hz
0CH	OLD_AUDIO_FREE_0C	080h					
0DH	OLD_AUDIO_FREE_0D	080h		30H	EW_PAR_60Hz	40H	East/West parabola 60Hz
0EH	OLD_AUDIO_FREE_0E	00Ch		31H	EW_COR_60Hz	4AH	East/West corner 60Hz
0FH	OLD_AUDIO_FREE_0F	028h		32H	EW_TRA_60Hz	32H	East/West trapezium 60Hz
				33H	V_SLOPE_60Hz	2BH	Vertical slope 60Hz
10H	OLD_AUDIO_FREE_10	023h		34H	V_AMP_60Hz	2FH	Vertical amplitude 60Hz
11H	OLD_AUDIO_FREE_11	014h		35H	S_CORR_60Hz	1FH	S-Correction 60Hz
12H	OLD_AUDIO_FREE_12	028h		36H	V_SHIFT_60Hz	2FH	Vertical shift 60Hz
13H	OLD_AUDIO_FREE_13	042h		37H	H_SHIFT_SECAM	1BH	Horizontal shift SECAM
14H	OLD_AUDIO_FREE_14	07Fh		38H	WHITE_P_RED	32H	Red reference (BKGD)
15H	OLD_AUDIO_FREE_15	042h		39H	WHITE_P_GREEN	32H	Green reference (BKGD)
16H	OLD_AUDIO_FREE_16	028h		3AH	WHITE_P_BLUE	32H	Blue reference (BKGD)
17H	OLD_AUDIO_FREE_17	073h		3BH	AGC_TOP_NOR	4CH	AGC take over point
18H	OLD_AUDIO_FREE_18	008h		3CH	IF_PLL_NOR	31H	IF PLL adjustment
19H	OLD_AUDIO_FREE_19	000h		3DH	VOL_CTRL_NOR	32H	Volume control
1AH	TXT_POS	34h	Teletext position	3EH	V_ZOOM_NOR	32H	Vertical zoom
1BH	ESCALA_COLOR	3Bh	Colour scale	3FH	SOURCE_SELECT_NOR	06H	One chip sub-address
1CH	ESCALA_BRILLO	4Dh	Brightness scale				
1DH	OLD_AUDIO_FREE_1D	12h	Free	40H	DECODER_MODE_NOR	C0H	One chip sub-address
1EH	OLD_AUDIO_FREE_1E	2Ah	Free	41H	CONTROL_VIDEO_2_NOR	82H	One chip sub-address
1FH	ESCALA_AUDIO	9Dh	Audio volume scale	42H	CONTROL_VIDEO_1_NOR	18H	One chip sub-address
				43H	CONTROL_VIDEO_0_NOR	80H	One chip sub-address
20H	PEAK_NOR	32H	Normalised peaking	44H	PRESET_FIRMA	A5H	Reserved
21H	BRI_NOR	28H	Normalised brightness	45H	PRESET_CHKSUM	9FH	Reserved
22H	SAT_NOR	32H	Normalised colour	46H	PEAK_ACT	32H	Current peaking
23H	CONT_NOR	50H	Normalised contrast	47H	BRI_ACT	28H	Current brightness

NVM Position List for Sharp Models 59CS03H and 66CS03H

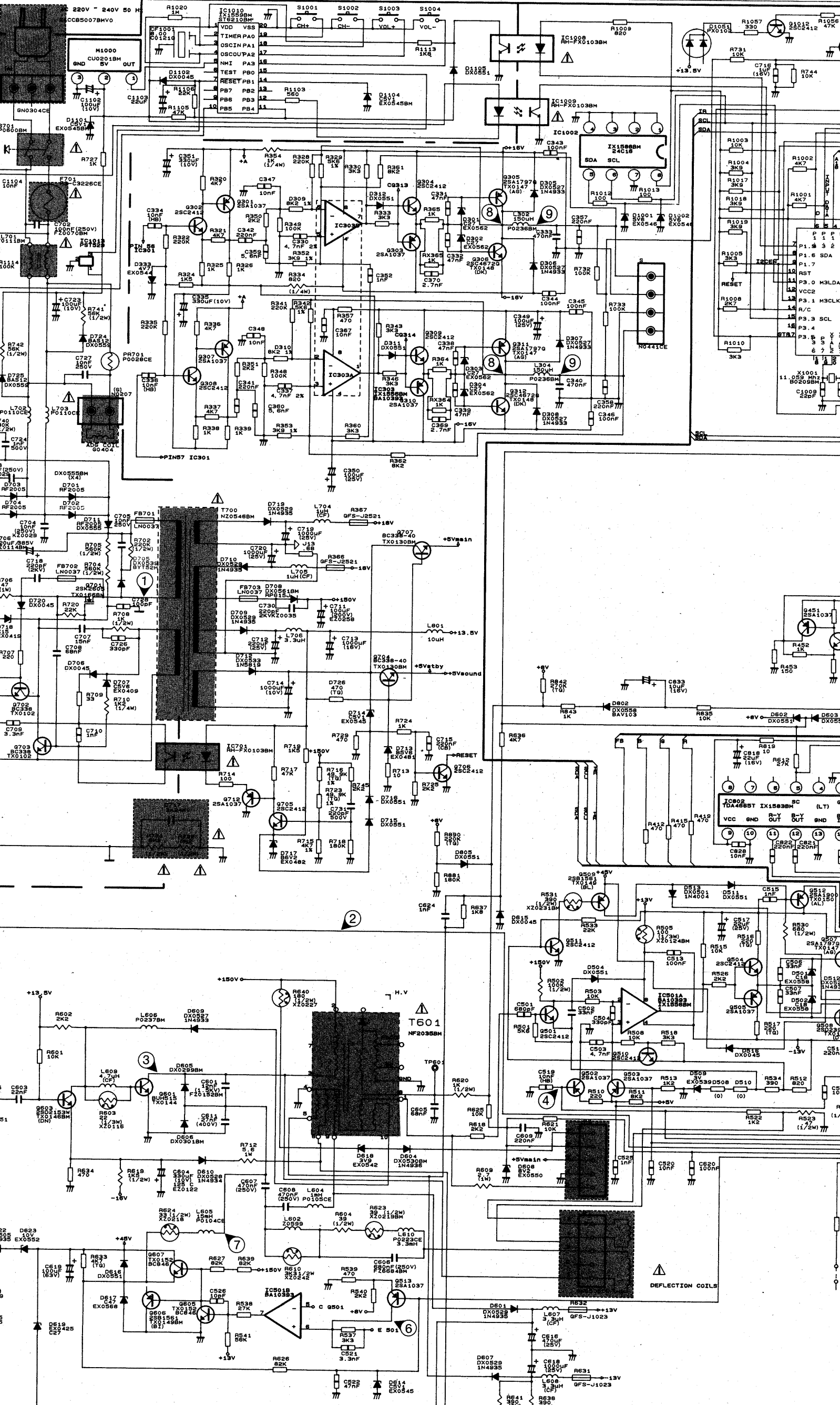
48H	SAT_ACT	32H	Current colour	6CH	REAL_TIME_SS	00h	Reserved
49H	CONT_ACT	50H	Current contrast	6DH	MICRO_TIME_DD	00h	Reserved
4AH	HUE_ACT	32H	Current hue	6EH	MICRO_TIME_HH	00h	Reserved
4BH	H_SHIFT_ACT	17H	Current horizontal shift	6FH	MICRO_TIME_MM	00h	Reserved
4CH	EW_AMP_ACT	58H	Current east/west amplitude				
4DH	EW_PAR_ACT	40H	Current east/west parabola	70H	MICRO_TIME_SS	00h	Reserved
4EH	EW_COR_ACT	4AH	Current east/west corner	71H	TINT_ACT	32h	Current tint control
4FH	EW_TRA_ACT	32H	Current east/west trapezium	72H	RGB_CONT	32h	Users RGB gain
				73H	BLACK_STRET	00h	Black stretcher on/off
50H	V_SLOPE_ACT	32H	Current vertical slope	74H	LAST_TVVIDEO	20h	Last video source selected
51H	V_AMP_ACT	21H	Current vertical amplitude	75H	BRILLO_DP	32h	Double page (teletext) page brightness
52H	S_CORR_ACT	1FH	Current S-Correction	76H	POS_76H	00h	Free
53H	V_SHIFT_ACT	33H	Current vertical shift	77H	POS_77H	00h	Free
54H	VOL_CTRL_ACT	32H	Current volume control	78H	POS_78H	00h	Free
				79H	POS_79H	00h	Free
55H	V_ZOOM_ACT	32H	Current vertical zoom	7AH	POS_7AH	00h	Free
56H	MTX_RGB_MIX	50H	RGB gain for mix mode	7BH	POS_7BH	00h	Free
57H	MTX_RGB_TXT	40H	RGB gain for teletext mode	7CH	POS_7CH	00h	Free
58H	MTX_RGB_OSD	4DH	RGB gain for OSD mode	7DH	POS_7DH	00h	Free
59H	ACTUAL_FIRMA	A5H	Reserved	7EH	TIMING_8_30	0Fh	Timing for name catching in auto-searching
5AH	ACTUAL_CHKSUM	00H	Reserved				
5BH	E_P_ACT	01h	Current program number	7FH	TIMING_VPS	60h	Number of errors for name catching in auto-searching
5CH	PRG_OLD	02h	Old program number (flashback)				
5DH	E_C_ACT	0EH	Current cable number				
5EH	E_A_ACT	15h	Current channel number				
5FH	LANGUAGE	01h	Language				
60H	NVM_EDITAR	00h	Reserved				
61H	EDI_LET1	00h	Reserved				
62H	EDI_LET2	00h	Reserved				
63H	EDI_LET3	00h	Reserved				
64H	EDI_LET4	00h	Reserved				
65H	POWER_MODE	01h	Stand by mode				
66H	PR_EDIT	01h	Reserved				
67H	AUTO_INSTALL	00h	Auto-installation control				
68H	COUNTRY	00h	Country				
69H	SER_STAT	03h	Reserved				
6AH	REAL_TIME_HH	00h	Reserved				
6BH	REAL_TIME_MM	00h	Reserved				



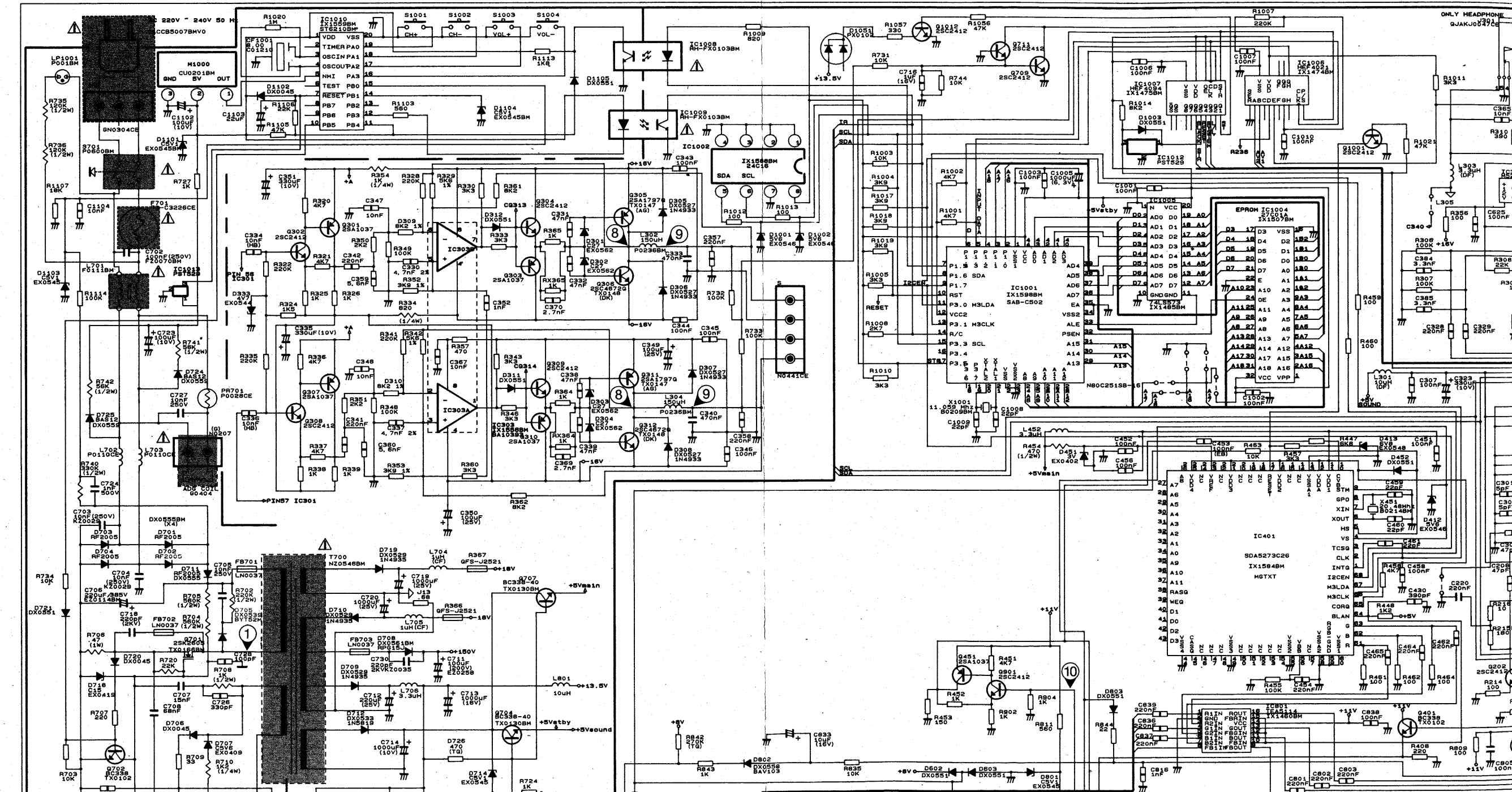
SCHEMATIC DIAGRAM 66CS03IR - 59CS03IR

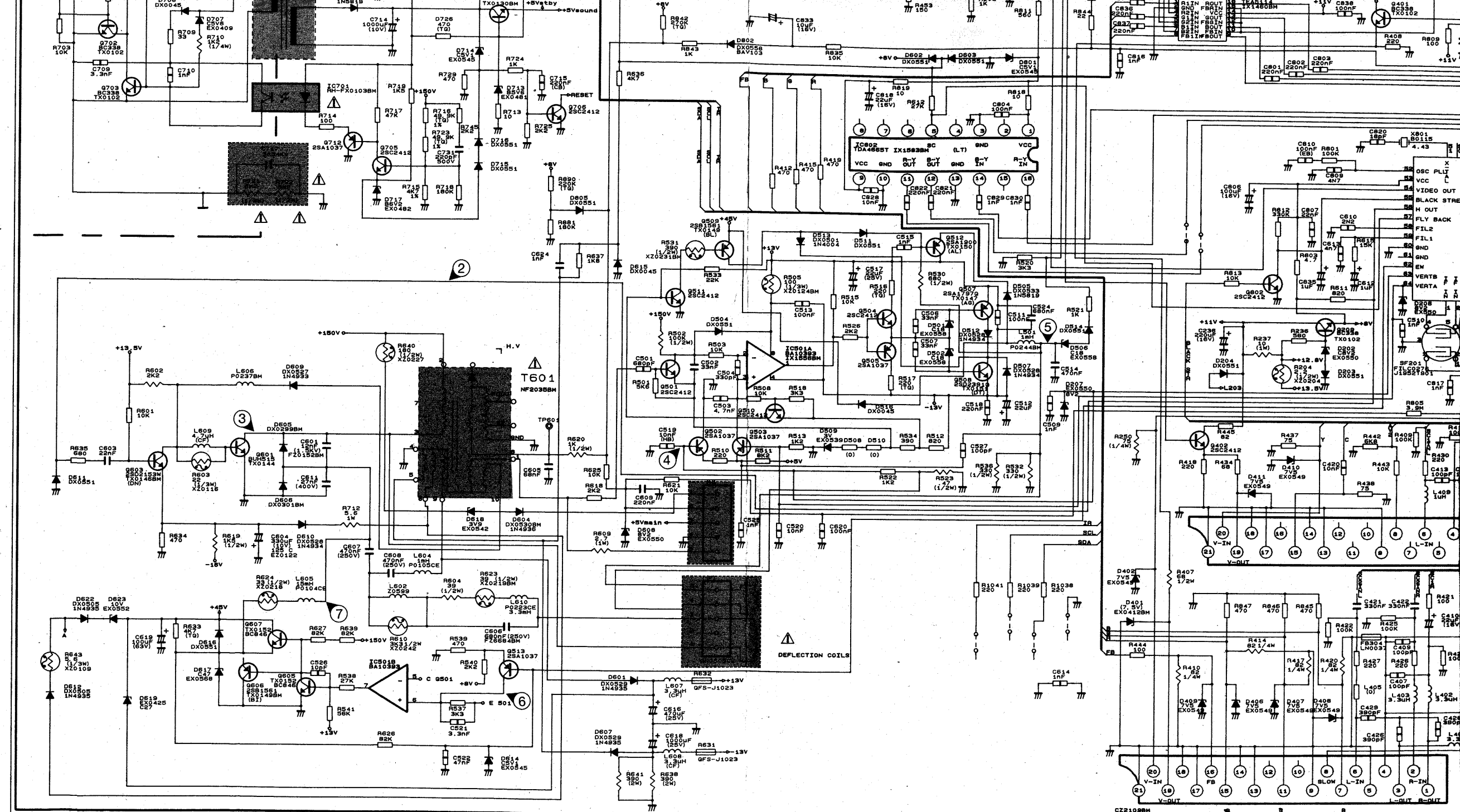






SCHEMATIC DIAGRAM 66CS03IR - 59CS03IR





SHARP

Technical Training



**Colour Television
CS-Chassis**

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Sharp Electronics (UK) Ltd
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Manchester

This self running power supply is based on a single Field Effect Transistor, Q701. The PSU will generate the following D.C. supplies: +150V, for the line output stage. +16V and -16V, for the audio output stages. +13V for the line drive circuit. The +5V supplies and the reset voltage for IC1001.

[illegible]

Current flows from the bridge rectifier via R704 and R705, turning on Q701. As Q701 begins to conduct, current will flow from the bridge rectifier, via the primary winding of T700, pins 12 and 17, through the FET and return to the bridge rectifier via R706. This current flow will cause an electro magnetic field to build within T700 which in turn, produces an EMF (approximately +25V) on the secondary windings of T700. When the potential difference across zener diode D707 is greater than 5.6V, the zener will conduct, turning on Q703. Once Q703 turns on Q701 will turn off resulting in the electro magnetic field within the transformer collapsing. As the field collapses the EMF at pin 15 will be taken negative. This results in the voltage at the junction of C707 & R708 to be approximately -13V, due to capacitor action this has the effect of holding Q701 off until the magnetic field has completely collapse then the cycle will be repeated.

It can be seen from the above, that this circuit oscillates, the frequency of oscillation will be dependant on load. The larger the load on the transformer, the longer Q701 will be turn on to enable larger transfer of energy. Therefore, the wavelength of the oscillator signal will increase, alternatively as the load decreases, less energy will be needed to be transferred across the transformer, therefore Q701 will turn off earlier shortening the wavelength of the oscillator signal.

Page 1

Regulation.

Due to the construction of the transformer, only one of the secondary supplies needs to be monitored to maintain a constant HT (150V). The 150V rail is fed to the base of Q705 via R716 (100k Ω), Q705 emitter is returned to the negative rail via D717 (6V2 zener) therefore to turn on Q705, the base will have to rise above 6.8V. Q705 turning on will remove the base bias from Q712, turning on Q712, which will allow current to flow through the LED section of the opto-coupler. The anode of the LED within the opto-coupler is connected to the 13.5V rail. This results in the transistor section of the opto-coupler turning on, increasing the voltage to the base of Q703, which in turn will turn on, turning off Q701, which will cause the 150V to fall.

Over-voltage Protection.

To prevent the 150V rail from increasing beyond safe limits under a fault conditions D707 (5V6 zener diode) is employed to monitor the EMF at T700 pin 15. If the voltage increases above the threshold, D707 will conduct, turning on Q703, which will turn off Q701 reducing the 150V rail.

Over-current Protection.

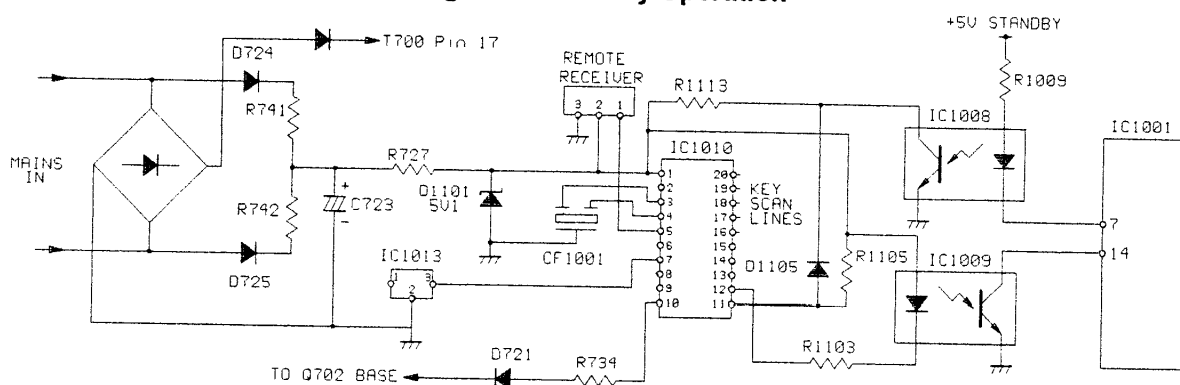
The current being drawn from the power supply is monitored by measuring the voltage drop across the FET source resistor R706. As the load on the power supply increases, the FET, Q701 will be turned on harder to stabilize the 150V rail. This in turn will increase the current flowing through the source resistor (R706). The junction of Q701/R706 is connected to the base of Q702 via D720 & R707. Once the voltage drop across R706 has increased sufficiently Q702 will turn on, turning off Q701, thus allowing the voltage drop across R706 to decrease. Once the voltage drop across R706 has fallen, Q702 will turn off allowing Q701 to turn on again. Q702 is also used to switch the power supply between standby & run.

Snubber Circuit.

During the time that the magnetic field is collapsing, the back EMF appearing in the primary winding will produce some very high positive voltage spikes. These spikes would be present on Q701 drain which would destroy it. To prevent this from happening, a snubber circuit consisting of D705, C705 and R702 is employed. This circuit will effectively short the primary winding of T700 when pin 3 becomes positive with respect to pin 8.

Power on Control.

Figure 5 - Standby Operation



The mains input is full wave rectified by D724 and D725 and smoothed by C723. This voltage feeds pin 1, VDD, of IC1010, the remote control receiver circuit, IC1013, which provides the reset pulse for IC1010 and the anode of the internal diode of the opto couple, IC1009.

The two opto couples: IC1008 and IC1009 are needed to provide isolation between primary and secondary circuits. Data from the power supply microprocessor to the main micro, IC1001, is output from pin 12 of IC1010 via IC1009 and is input into pin 14 of IC1001. This includes remote control and key scan data. The command for standby/on control is from Pin 7 of IC1001, via IC1008 to pin 11 of IC1010. The output for control of the power supply is pin 10 of IC1010. This pin is high in standby and is taken low to turn on the power supply.

Class D Output Stage.

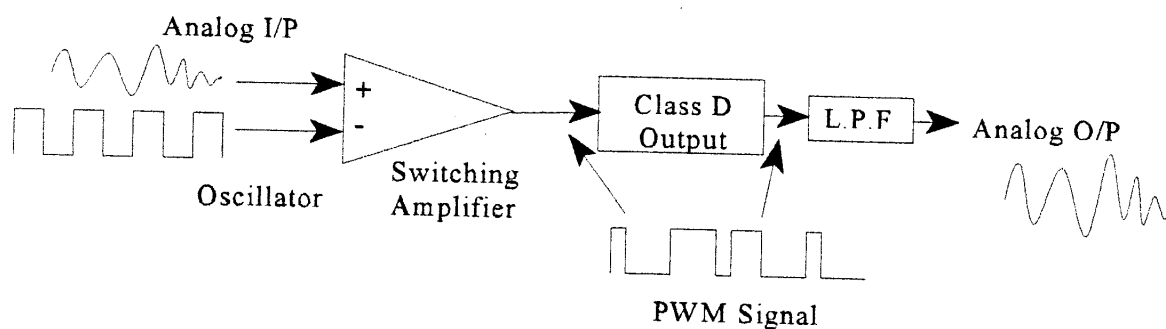
The Sound, Frame and East/West output stages in the CS chassis are operated in a class D bias configuration. That is the output transistors are acting as switches, and not amplifiers. The advantages of this type of biasing system are minimal power consumption with minimal distortion as shown in the table below.

Class	Distortion	Efficiency	Output
A	Low	Low	Output = Input
AB	Low input signal see class A High input signal see class B		
B	Crossover	High	Output is obtained from a single transistor from only half of its input signal
C	High	High	Output is obtained from less than half of the input signal
D	Low	High	Output = Input

However, this system has a fundamental disadvantage, you can not use a switch to amplify an analog signal. To overcome this problem the analog signal is first converted to a pulse width modulated (PWM) signal by a switching amplifier with a fixed frequency of 15.625kHz for the Frame & East/West stages and a varying frequency of between 120kHz to 140kHz for the Audio stage. The amplitude of the modulating frequency will cause the mark space ratio of the pulse to alter. After the Class D stage the PWM signal has to be converted back to an analog form before it can be used, this is achieved by a low pass filter.

Another disadvantage of this system is with two or more audio output stages, it is possible for an audible whistle to be produced from the separate oscillators beating with each other if they become out of phase. If both transistors were to be turned on together then the current flow through the devices would be at a level that could cause the devices to fail. The zener diodes and capacitors in the base circuit of the output transistors ensures that only one transistor is switched on at anytime.

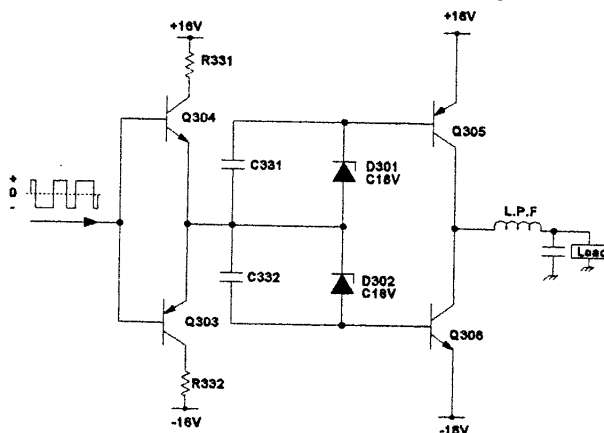
Figure 6 - Output Stage Block Diagram



When the output from the op-amp is negative, Q303 is on. Q305 will be turned on via D301, C331 will then be charged to the zener voltage of D301.

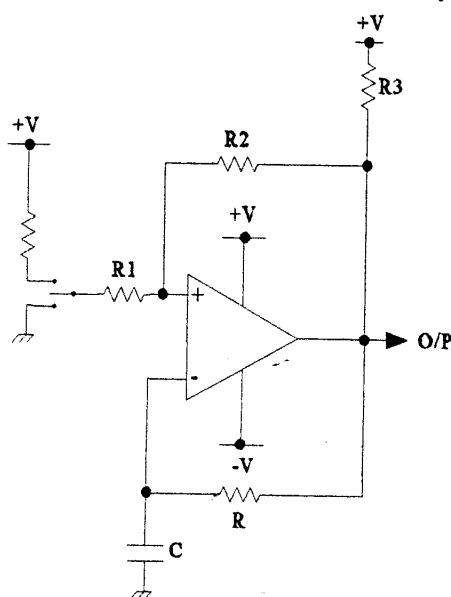
The top plate positively charged and the bottom plate negative. When the output from the op-amp goes positive, the negative charge on C331 will hold off Q305 until Q305 is turned off. When Q305 is turned on and Q306 turned off, current will flow from the positive rail through Q305, L.P.F and the load to Zero rail (Ground). When Q305 is turned off and Q306 turned on, current will flow from Ground through the load, L.P.F and Q306 to the negative rail.

Figure 7 - Class D Push Pull Output



Switching Amplifier.

Figure 8 - Simple Switching Amp



$$\text{Gain} = \frac{R1}{R1 + R2}$$

$$V+ > V- \Rightarrow V_{\text{out}} = +V$$

$$V+ < V- \Rightarrow V_{\text{out}} = -V$$

The gain of the above circuit is set by the values of R1 and R2.

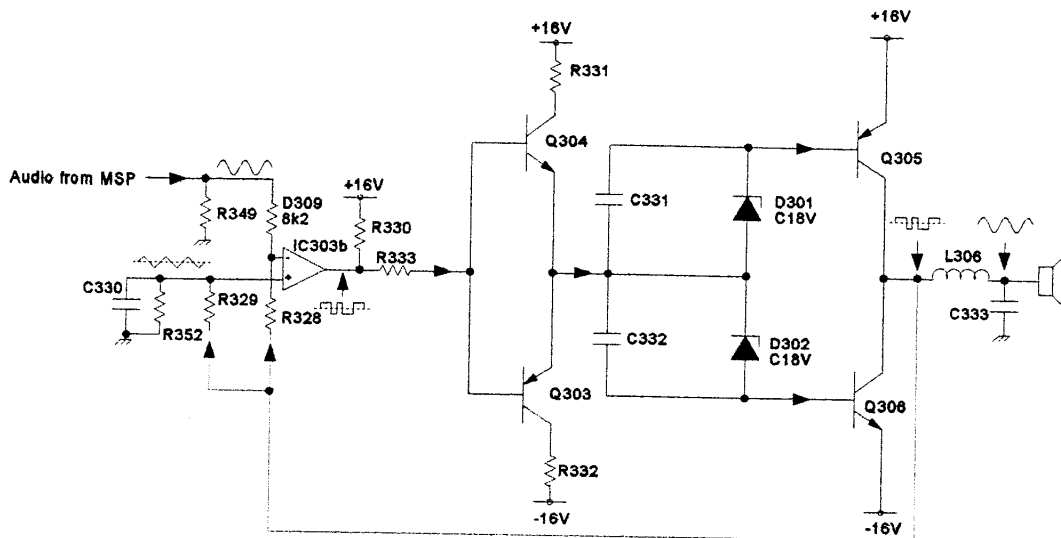
In the above circuit, the operational amplifier has an open collector output, which is taken high through R3. When the input switch is to ground the output will be high (+V), until C has charged enough to make the negative (Inverting) input higher than the positive (Non-Inverting) input. Then the output will go low (-V). The output will stay low until C discharges below the positive input, then the output will go high again. The circuit will oscillate at a frequency set by the values of R and C ($f = RC$).

If the positive input voltage is taken higher, by changing the position of the switch, then it will take longer for the charge on C to rise above input voltage. This will mean the output will stay high longer. Therefore we have changed the mark space ratio of the op-amp. output.

It can be seen then that by applying an alternating input to the above circuit, it would behave as a pulse width modulator. ie The output pulse width is changed dependant upon the changing input voltage. If the output signal is then passed through a low pass filter, the output from the filter would be the same as the input signal.

Audio Output Stage.

Figure 9 - Right Hand Channel



The above diagram shows the right channel audio output stage, the left channel is identical. IC303 is the switching amplifier, feedback for the oscillator is taken from the output, at the junction of the collectors of Q305 and Q306. This compensates for phase error caused by the output circuit. The frequency is set by the integrator circuit R329 and C330. The frequency of oscillation is between 120kHz and 140kHz.

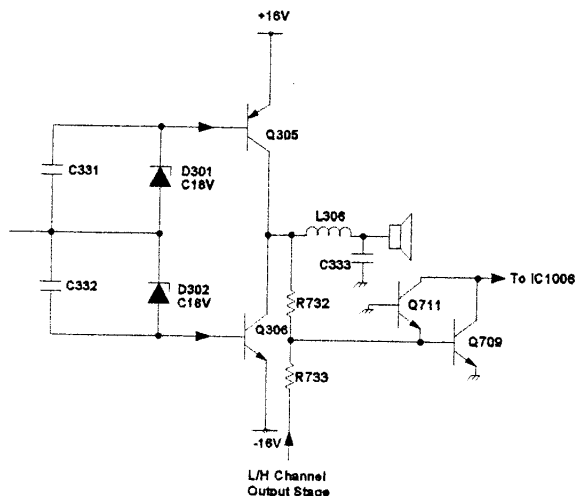
The audio signal is applied to the inverting input of the op-amp, whilst the feedback ramp from the integrator is applied to the non-inverting input. Therefore the PWM output is a result of both of these signals. When the PWM signal is passed through the low pass filter the signal consists of the original audio signal with the high frequency ramp superimposed over it. As this frequency is supersonic there is no need for additional filtering.

It is necessary to ensure that both put stages are synchronised to prevent them from causing a beat frequency, which could become audible. This is done by coupling the non-inverting amplifiers of both channels switching amplifiers, via C352 and R360 (not shown).

Audio Output Stage Protection.

The audio output stages are protected against short circuit, to prevent damage to the other parts of the circuit or damage to the PWB caused by overheating.

Figure 10 - Audio O/P Protection



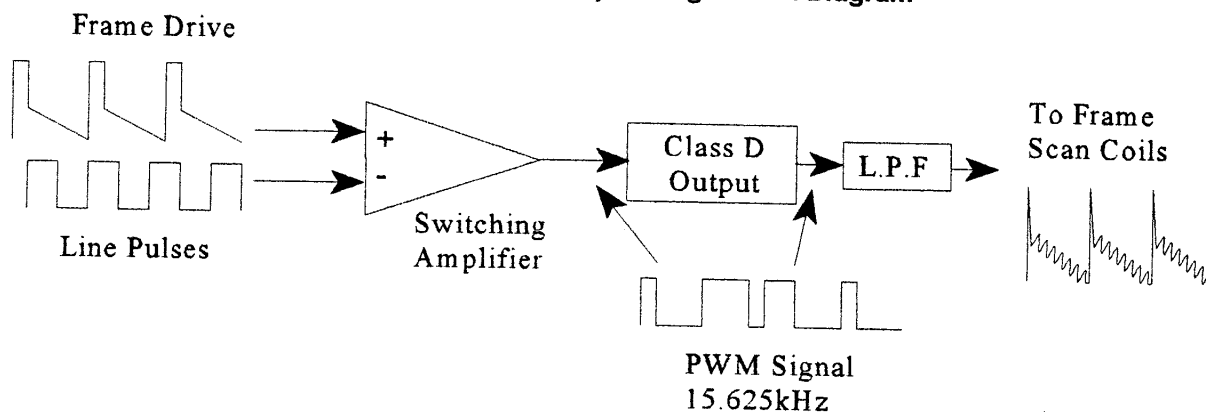
The mean voltage level at the junction of the output transistors will be zero volts. If a short circuit occurs in one of the output transistors, the mid point will be connected to either the +16V supply or the -16V supply. When both output stages are operating correctly the voltage at the junction will be zero. Q711 and Q709 will be off.

When a fault develops, the junction of R732 and R733 will be taken either to the +16V rail or the -16V rail depending on which transistor is short circuit. If the voltage at the junction of Q709 base & Q711 emitter went positive, Q709 will be turned on. However, if the voltage at this junction went negative then Q711 will be turned on. Both of these conditions will give a low signal to the protection input of IC1006 (microprocessor input port expander). This will trigger the microprocessor to switch the set to standby.

Field Output Stage.

The field output stage is similar to the audio output stages. However, because the frame scan frequency is fixed, the switching amplifier oscillator frequency is fixed. Also the frame scan must be in phase with the line, therefore, instead an additional oscillator, line pulses are applied to the oscillator input of the switching amplifier.

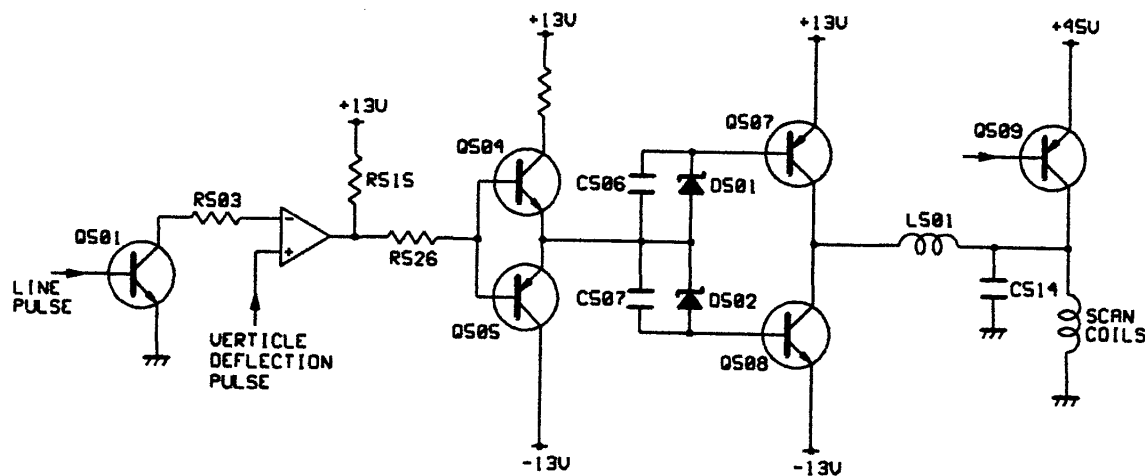
Figure 11 - Frame Output Stage Block Diagram



It therefore can be seen that output from the switching amplifier is the resultant of line pulses modulated by the frame drive signal. After passing through the low pass filter, the signal becomes a 50Hz ramp waveform with line pulses superimposed.

During flyback, when a larger pulse is required to move the spot quickly back to the top of the screen, Q509 is turned on by the flyback pulse and connects a line stage derived +45V D.C. to the scan coils for the duration of the flyback period.

Figure 12 - Basic Frame Output Circuit



Micro Processor Circuit

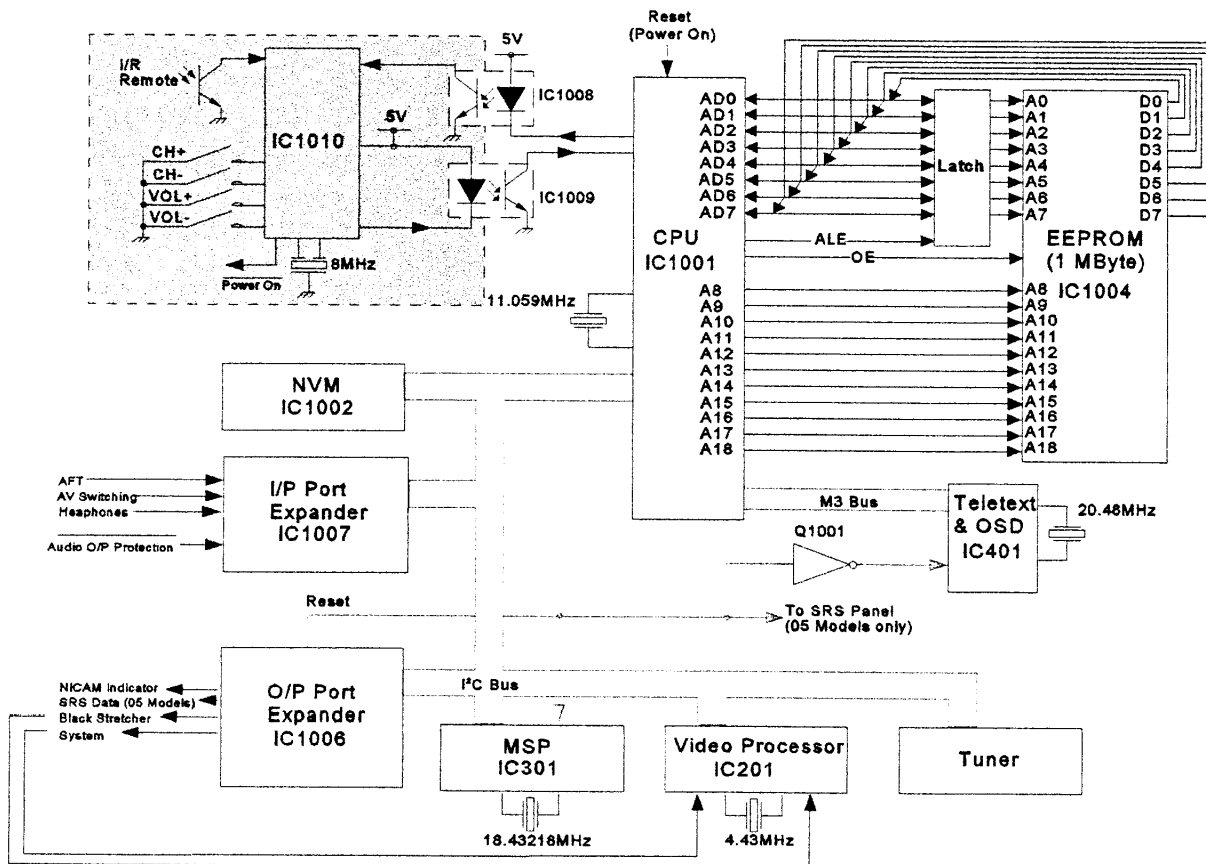
This part of the circuit is similar to that which has been used in previous Sharp Large Screen CTV. It consists basically of four IC's

IC1001	Central Processor	
IC1002	Non Volatile Memory	Unlike previous models, this device is supplied without programme data. The default values will be set by the EEPROM automatically on switch on.
IC1004	EEPROM	This contains the program to run the CTV. It is important that when replacing this IC it should be replaced with the part specified by the part number for the particular model (Not IC type).
IC1006	Input port expander	
IC1007	Output port expander	

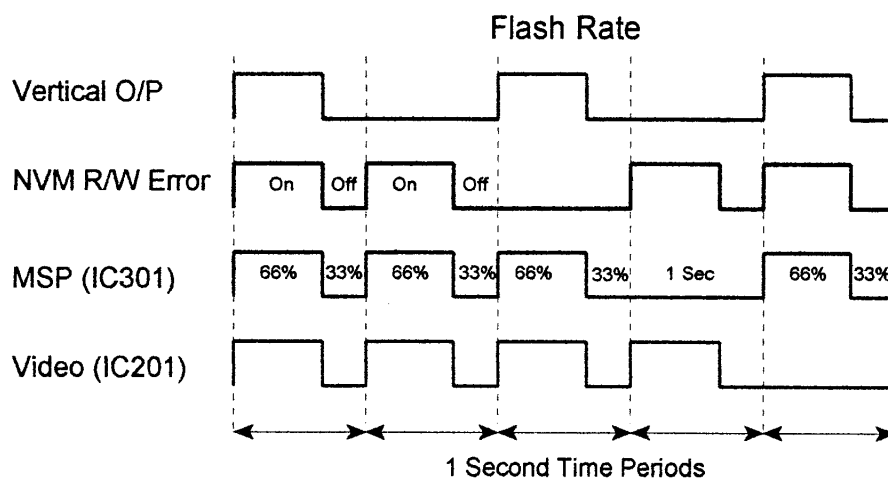
The CPU will communicate with the key IC via a data bus. Most of the communication is carried out via the I²C bus, except for the Megatext Chip (IC401) which employs the M3 bus system and the EEPROM which has a parallel address. Both the M3 and I²C buses are a two line serial bus system, one line is the clock (CK) to synchronise the data and the other line contains the data (D). This Data line contains two way communications.

Additionally the CS-Chassis employs an extra microprocessor, contained within the live side of the power supply (IC1010). This will control the switching of the set between standby & run, and supplies data to the CPU from the remote control, and the customer controls on the front of the cabinet. The CPU has two direct connections with IC1010 via opto-couplers IC1008 & IC1009 to maintain power supply isolation. CPU pin 14 excepts data from IC1010 and CPU pin 7 sends data to IC1010.

Figure 13 - Data Communications



Apart from tuning, Picture Geometry & Sound levels, this circuit is also monitoring key areas of the CTV for fault detection. If a fault is detected then the CTV will either be switched to Standby Mode, or the line drive is removed which will give an outward appearance that the CTV is in Standby Mode, but the Power supply will still be operating. In either case the reason for the fault is not obvious. To assist with fault diagnostics the NICAM indicator will be switched on & off at different rates for different faults.



NVM Default Values

As already stated when replacing the NVM the default values are automatically downloaded from the CPU (IC1001). However it is possible to instruct the CPU to reset the NVM values at other times without altering the Tuner settings.

This is achieved by placing the CTV into service mode, Select NVM location '00', currently the data in this location should read '00'(reset default values off). Next adjust data to read '01'(reset default values on) and press the standby button to store this new data. Switch the CTV off and then back on again. The first thing you will notice is that the CTV appears to take longer to switch on this is because the NVM data is being reset before it allows the picture to appear. Once the picture has appeared, select service mode and make necessary adjustment that are needed. If you inspect NVM location '00' again you will notice that the data has also been reset to '00' automatically.

Adjustment Procedures

The adjustments for this chassis is carried out by accessing the service mode, then using the channel up& down buttons on the handset to select the function & the volume up & down buttons on the handset to carry out the adjustment. Once the adjustment has been made press the Power button on the handset to store the setting before moving on to the next function. **Do Not** adjust any of the data for the NVM function unless instructions has been issued by Sharp.

The complete adjustment procedure is contain in a separate service manual to the circuit diagram. These are available from Teega, however, the procedure for the adjustment of G2 & Grey Scale has been simplified as follows:

G2 Adjustment

1. Tune the CTV to a broadcast
2. Set the G" to maximum and then reduce it until the flyback lines disappear
3. Reduce Colour to minimum
4. Reduce Contrast to minimum
5. Reduce the brightness until the picture is just visible
6. Adjust G2 until 110V +/-3V is obtained on the Red Cathode of the CRT
7. Return Brightness, Contrast & Colour to Normal

Grey Scale Adjustment

1. Set Tint control to centre position
2. Place CTV into the Service Mode
3. Set Green reference to "2C"
4. Set Blue reference to "2C"
5. Set Red reference to "32"
6. Adjust either Blue or Green reference to obtain correct grey scale. **Do Not** adjust the Red reference
7. Store the new settings

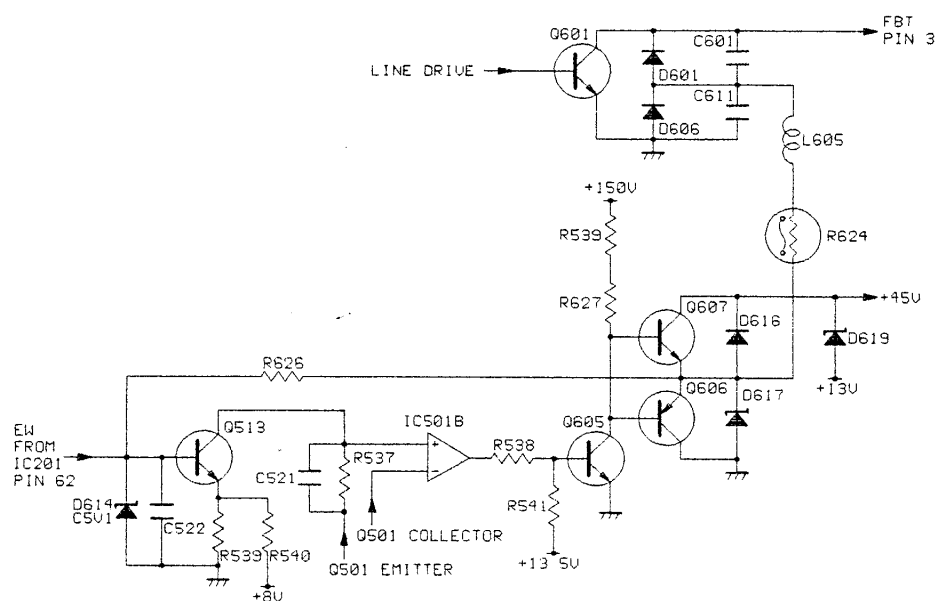
East-West correction circuit.

The CS chassis uses a conventional diode modulator circuit for East-West correction. However, the amplifier section is of the switching amplifier type.

The EW parabola from pin 62 of IC201, the video processor IC, is amplified by Q513 and fed into the non inverting input of the op. amp., IC501B. As in the field output stage the line pulse is used for switching. The output from the op-amp. is applied to the output switching circuit Q605, Q606 and Q607 and fed to the diode modulator circuit via R624 and L605. L605 is needed to filter out high voltage line flyback pulses to prevent them from damaging the switching circuit.

The parabola, when applied to the diode modulator is 1.4V peak to peak, this changes the conduction of the diodes, which effectively changes the value of C601 and C611. Changing the value of these capacitors, which are the flyback tuning capacitors, will cause a change in the EHT. The frame parabola

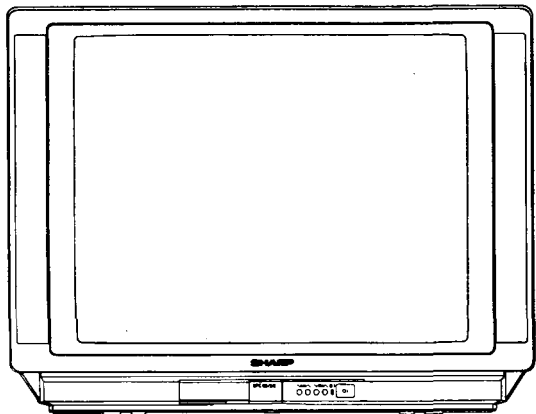
Figure 15 - 66C303H East West Circuit



will cause the EHT to increase at the top and bottom of the picture, causing the width to be reduced and will reduce the EHT at the centre of the screen, causing an increase in width.

SHARP SERVICE MANUAL

SEKD70CS03SC2



ELECTRICAL INFORMATION

CS-CHASSIS

PAL SYSTEM COLOUR TELEVISION

MODELS 63CS-03SC
70CS-03SC

In the interests of user safety (required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

^ CONTENTS S	
ELECTRICAL SPECIFICATION	2
IMPORTANT SERVICE NOTES	3
PREVIOUS NOTES	4
CHASSIS LAYOUT	5
PRINTED WIRING BOARDS	6
SCHEMATIC DIAGRAM	8
BLOCK DIAGRAM	9
PARTS LIST	10
}	

SHARP CORPORATION

ELECTRICAL SPECIFICATIONS

•Power Input.....220-240 VAC 50HZ

'Intermediate Frequencies

•Power Consumption (at 240 VAC)

Picture IF Frequency.....38.9 MHz

Sound IF Carrier Frequency.....33.4MHz

Colour Sub-Carrier Frequency.....34.47 MHz
(Nominal)

Normal operating.....120 Wmax.

Stand-by Operating..... 3Wmax.

•Aerial Input Impedance

•Audio Power

VHF/UHF.....75 ohm Unbalanced

Tuning Ranges.....48.25MHz to 855.25MHz
CATV Special Channels

Output Rating..... 10W(MPO)x2

Speaker.....6cm. x 13 cm. (elliptic)

Voice coil impedance.....8 ohms

•Convergence.....Self Converging System

Focus.....Bi-Potencial Electrostatic

Sweep.....Magnetic

•White Level

Set brightness control to get total picture tube cathode current of 600 microampere under no signal condition. Maximum necessary correction of each picture tube cathode current to get 8900 degrees K-20MPCD screen temperature should not exceed 15% of its original value.

X=0.290 Y=0.284

Specifications are subject to change without prior notice

WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis.

To prevent electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be done by qualified service personnel only.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10 k ohm Resistor in series with an insulated wire (such as test probe) between picture tube ground tag and high voltage lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely.

X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the following precautions should be observed:

1. When repairing the circuit, be sure not to increase the high voltage to more than 30.0 kV, (at beam 1000 uA) for the set.
2. To keep the set in a normal operation, be sure to make it function on 26kV $\pm$ 1 -5kV (at beam 1300 pA) in the case of the set. The set has been factory Adjusted to the above-mentioned high voltage.
If there is a possibility that high voltage fluctuates as a result of the repairs, never forget to check for such high voltage after the work.
3. Do not substitute a picture tube with unauthorized types and/or brands which may cause excess X-ray radiation.

BEFORE RETURNING THE RECEIVER

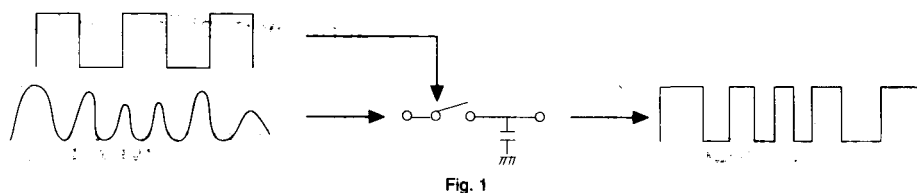
Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not logged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, insulation resistor-capacity networks, mechanical insulators etc.

PREVIOUS NOTES

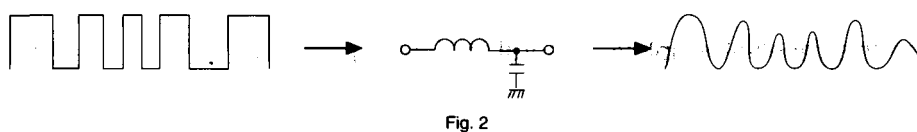
Since most of the power amplifiers of this TV, works in switching mode (class D) a general explanation of this system is as follows.

The system is based on moving the duty cycle of a square wave according to a modulator wave of any shape as is shown in fig. 1:



The way of working the signal is known as PWM (Pulse With Modulation).

After the modulated signal is amplified, a conversion to the original signal shape is made by using adequate low pass filters (LC filters), fig. 2:



VERTICAL AMPLIFIER

Horizontal pulses are modulated (PWM mode) with the vertical saw-tooth signal (IC501 A) to get the switching modulated signal, once it is amplified it is driven out through the low pass filter (L501) to the deflection coils.

EW AMPLIFIER

As in the above case, the horizontal pulses are modulated with the EW signal generated by the IC201. This is done by means of the IC501 B and L605.

AUDIO POWER AMPLIFIER

The audio amplifier consists of an oscillator whose frequency and duty cycle moves according to the audio signal. This is done by IC303 and the switching signal is converted back into its original shape by means of L302/L304.

NEW SOFTWARE TO ASSIST WITH THE ADJUSTMENT OF GEOMETRY IN SERVICE MODE AND TO SHOW UP FAILURES.

TO ASSIST WITH THE ADJUSTMENT OF GEOMETRY

- On entering the ADJUSTMENT GEOMETRY MENU of Service Mode, a self-generated card appears to facilitate the adjustment of geometry when an adequate card is not available for this purpose.

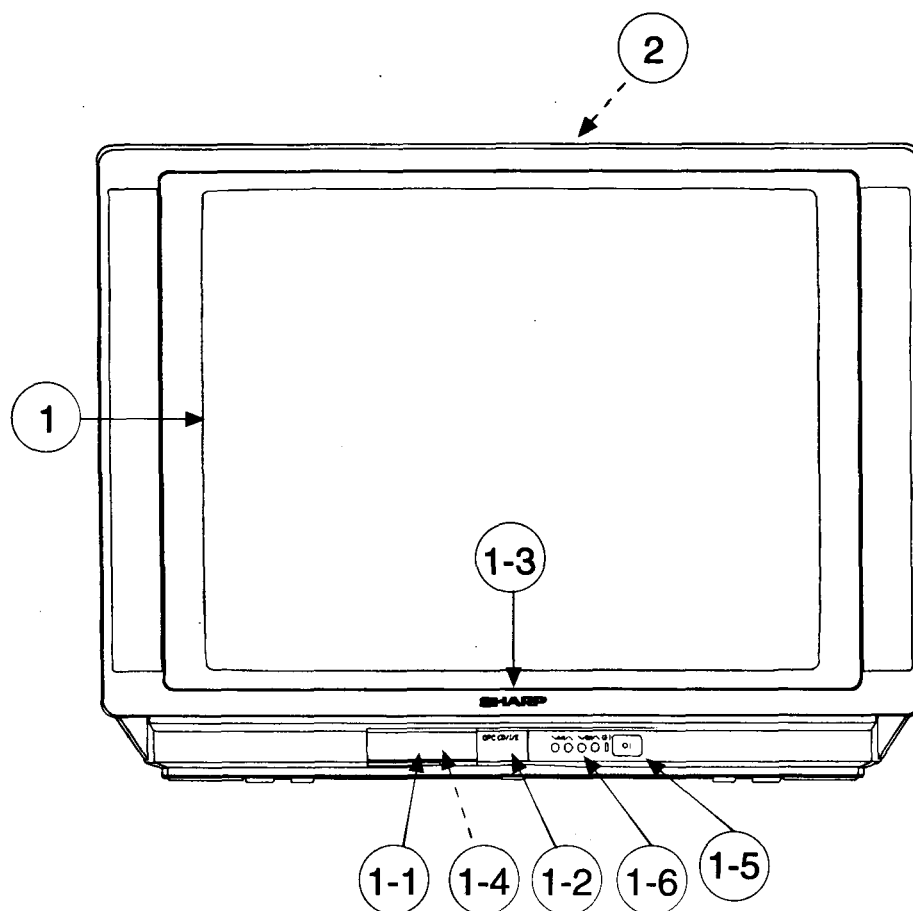
THE SHOWING UP OF FAILURES

- If a failure is detected when the set is switched on, the stereo led will pulsate.
 - One flash of the stereo led shows vertical deflection failure.
 - Two consecutive flashes shows that the reading and or writing of the NVM is impossible.
 - Three consecutive flashes shows a failure on MSP.
 - Four consecutive flashes shows a failure on IF (1C) / Video Process (One-Chip).

PARTS LIST REPLACEMENT PARTS					REF. NO.	PART NO.	*	DESCRIPTION	CODE
Replacement parts which have special safety characteristics are identified in this manual. Electrical components having such features are identified by A in the Replacement Parts list. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended is not permitted. Replacement parts not shown in this service manual may create shock, fire or other hazards. HOW TO ORDER REPLACEMENT PARTS To have your order completed promptly and correctly please supply the following information. 1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION 5. CODE 6. QUANTITY * MARK: SPARE PARTS DELIVERY SECTION					TRANSISTORS				
					00201	VS2SC2412KQ-1	S	2SC2412	AA
					00202	VS2SC2412KQ-1	S	2SC2412	AA
					002031	VS2SA1037KQ-1	S	BC807	AA
					Q0209	RH-TX0102BMZZ	S	BC338	AB
					Q0301	VS2SA1037KQ-1	S	BC807	AA
					00302	VS2SC2412KQ-1	S	2SC2412	AA
					Q0303	VS2SA1037KQ-1	S	BC807	AA
					00304	VS2SC2412KQ-1	S	2SC2412	AA
					Q0305	RH-TX0147BMZZ	S	2SA1797T100	AD
					Q0306	RH-TX0148BMZZ	S	2SC4672T100	AD
					Q0307	VS2SA1037KQ-1	S	BC807	AA
					Q0308	VS2SC2412KQ-1	S	2SC2412	AA
					Q0309	VS2SC2412KQ-1	S	2SC2412	AA
					Q0310	VS2SA1037KQ-1	S	BC807	AA
					Q0311	RH-TX0147BMZZ	S	2SA1797T100	AD
					Q0312	RH-TX0148BMZZ	S	2SC4672T100	AD
					Q0401	RH-TX0102BMZZ	S	BC338	AB
					Q0402	VS2SC2412KQ-1	S	2SC2412	AA
					Q0451	VS2SA1037KQ-1	S	BC807	AA
					Q0501	VS2SC2412KQ-1	S	2SC2412	AA
					Q0502	VS2SA1037KQ-1	S	BC807	AA
					Q0503	VS2SA1037KQ-1	S	BC807	AA
					Q0504	VS2SC2412KQ-1	S	2SC2412	AA
					Q0505	VS2SA1037KQ-1	S	BC807	AA
					Q0506	VS2SC2412KQ-1	S	2SC2412	AA
					Q0507	RH-TX0147BMZZ	S	2SA1797T100	AD
					Q0508	RH-TX0151BMZZ	S	2SD2391	AD
					Q0509	RH-TX0149BMZZ	S	2SB1561	AD
					Q0510	VS2SC2412KQ-1	S	2SC2412	AA
					Q0511	VS2SC2412KQ-1	S	2SC2412	AA
					Q0512	RH-TX0150BMZZ	S	2SA1900T100	AC
					Q0513	VS2SA1037KQ-1	S	BC807	AA
					Q0514	RH-TX0144BMZZ	S	BUH515	AK
					Q0605	RH-TX0152BMZZ	S	BC846	AA
					Q0606	RH-TX0149BMZZ	S	2SB1561	AD
					Q0607	RH-TX0152BMZZ	S	BC846	AA
					Q0701	RH-TX0145BMZZ	S	4NA80PI	AM
					Q0702	RH-TX0102BMZZ	S	BC338	AB
					Q0703	RH-TX0102BMZZ	S	BC338	AB
					Q0705	VS2SC2412KQ-1	S	2SC2412	AA
					Q0706	VS2SC2412KQ-1	S	2SC2412	AA
					Q0707	RH-TX0130BMZZ	S	BC338	AB
					Q0709	VS2SC2412KQ-1	S	2SC2412	AA
					Q0711	VS2SC2412KQ-1	S	2SC2412	AA
					Q0712	VS2SC2412KQ-1	S	2SC2412	AA
					Q0801	VS2SC2412KQ-1	S	2SC2412	AA
					Q0802	VS2SC2412KQ-1	S	2SC2412	AA
					Q0901	VS2SC2412KQ-1	S	2SC2412	AA
					Q1001	VS2SC2412KQ-1	S	2SC2412	AA
					Q1012	VS2SC2412KQ-1	S	2SC2412	AA
PICTURE TUBE					DIODES				
A	VB66EAK25211E	S	C.R.T. 28"	CZ	D0201	RH-DX0551BMZZ	S	LL4148	AA
A	VB59EAK25211E	S	C.R.T. 25"	CY	D0202	RH-EX0550BMZZ	S	Zener 8.2V	AA
A	CCILG0304WEV1	S	DEGAUSSING COIL 28"	AW	D0203	RH-DX0551BMZZ	S	LL4148	AA
A	CCILG0303WEV1	S	DEGAUSSING COIL 25"	AU	D0204	RH-DX0551BMZZ	S	LL4148	AA
PRINTED WIRING BOARD ASSEMBLIES					D0205	RH-DX0551BMZZ	S	LL4148	AA
PWB-A	DUNTK7185CJW7	S	Mother Unit 70CS03SC	CN	D0206	RH-EX0550BMZZ	S	Zener 8.2V	AA
PWB-A	DUNTK7185CJW8	S	Mother Unit 63CS03SC	CN	D0207	RH-EX0550BMZZ	S	Zener 8.2V	AA
PWB-B	DUNTK7186BMW7	S	Socket unit 70CS03SC	BG	D0301	RH-EX0562BMZZ	S	Zener 27V	AA
PWB-B	DUNTK7186BMW8	S	Socket Unit 63CS03SC	BG	D0302	RH-EX0562BMZZ	S	Zener 27V	AA
MOTHER UNIT					D0303	RH-EX0562BMZZ	S	Zener 27V	AA
TUNER					D0304	RH-EX0562BMZZ	S	Zener 27V	AA
NOTE: The parts shown here are supplied as an assembly but not separately.					D0305	RH-DX0527BMZZ	S	1N4933	AA
TH 0201	RTUNH0111BMZZ	S	Tuner	BC	D0306	RH-DX0527BMZZ	S	1N4933	AA
INTEGRATED CIRCUITS					D0307	RH-DX0527BMZZ	S	1N4933	AA
IC 0301	RH-IX1592BMZZ	S	TDA8375A	BB	D0308	RH-DX0527BMZZ	S	1N4933	AA
IC 0302	VHIM5218L/-1	S	MSP3410B	BD	D0311	RH-DX0551BMZZ	S	LL4148	AA
IC 0303	RH-IX1556BMZZ	S	M5218L	AF	D0312	RH-DX0551BMZZ	S	LL4148	AA
IC 0401	RH-IX1584BMZZ	S	BA10393	AD	D0333	RH-EX0544BMZZ	S	Zener 4.7V	AA
IC 0501	RH-IX1556BMZZ	S	MGTEXT SDA5273C26	AN	D0401	RH-EX0412BMZZ	S	Zener BZX79C7.5V	AB
A IC 0701	RH-FX0103BMZZ	S	BA10393	AD	D0402	RH-EX0549BMZZ	S	Zener 7.5V	AA
IC 0801	RH-IX1460BMZZ	S	MOC8105SR2	AD					
IC 0802	RH-IX1583BMZZ	S	MOC8105SR2	AD					
IC 0901	RH-IX1558BMZZ	S	TEA5114A	AL					
IC 1001	RH-IX1598BMZZ	S	TDA 4665T	AM					
IC 1002	RH-IX1588BMZZ	S	TDA 8395T	AS					
IC 1003	RH-IX0037CEZZ	S	SAB-C502	AX					
IC 1004	CH-IX1507CJC1	S	NVM24C16	AQ					
IC 1004	CH-IX1507CJCO	S	UPC574J 33V	AD					
IC 1005	RH-IX1485BMZZ	S	EPROM 63CS03SC	AU					
IC 1006	RH-IX1474BMZZ	S	EPROM 70CS03SC	AU					
IC 1007	RH-IX1475BMZZ	S	SN74ALS 573	AK					
A IC 1008	RH-FX0103BMZZ	S	HEF4021BT	AE					
A IC 1009	RH-FX0103BMZZ	S	HEF4094BT	AE					
IC 1010	RH-IX1559BMZZ	S	MOC8105SR2	AD					
IC 1012	VHIPST529C2-1	S	MOC8105SR2	AD					
IC 1013	VHIPST529C2-1	S	ST6210BM	AU					

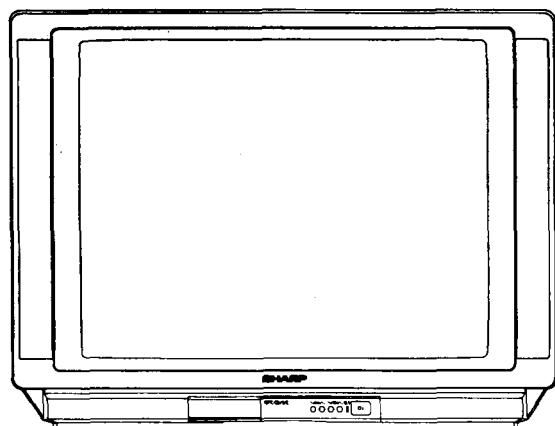
REF. NO.	PART NO.	*	DESCRIPTION	CODE	REF. NO.	PART NO.	*	DESCRIPTION	CODE	
D0405	RH-EX0413BMZZ	S	Zener BZX79C8 2V	AB	D 1102	RH-DX0045BMZZ	S	1N4148	AA	
D0406	RH-EX0549BMZZ	S	Zener 7.5V	AA	D 1103	RH-EX0545BMZZ	S	Zener 5.1V	AA	
D0407	RH-EX0549BMZZ	S	Zener 7.5V	AA	D 1104	RH-EX0545BMZZ	S	Zener 5.1V	AA	
D0408	RH-EX0549BMZZ	S	Zener 7.5V	AA	D 1105	RH-DX0551BMZZ	S	LL4148	AA	
D0409	RH-EX0549BMZZ	S	Zener 7.5V	AA	PACKAGED CIRCUIT					
D0410	RH-EX0549BMZZ	S	Zener 7.5V	AA	PR 0701 X0301 X0451 X0801 X 1001	RMPTP0028CEZZ RCRSB0203BMZZ RCRSB0214BMZZ RCRSB0115BMZZ RCRSB0209BMZZ	S S S S S	PTC Crystal 18.432MHz Crystal 20.48MHz Crystal 4.43MHz Crystal 11.0592MHz	AG AG AH AG AG	
D0411	RH-EX0549BMZZ	S	Zener 7.5V	AA						
D0412	RH-EX0545BMZZ	S	Zener5.1V	AA						
D0413	RH-EX0548BMZZ	S	Zener 6.8V	AA						
D0451	RH-EX0402BMZZ	S	Zener BZX79C3.0V	AB						
D0452	RH-DX0551BMZZ	S	LL4148	AA	COILS					
D0501	RH-EX0558BMZZ	S	Zener18V	AA	A	L0201 L0202 L0203 L0205 L0301 L0302 L0303 L0304 L0452 L0501 L0602 L0604 L0605 L0606 L0607 L0608 L0609 L0610 L0701 L0702 L0703 L0704 L0705 L0706 L0801	S S S S S S S S S S S S S S S S S S S S S S S S S	VP-NM100KR42N VP-NM100KR42N VP-DF470K0000 RCILP0224BMZZ VP-DF100K0000 RCILP0236BMZZ VP-DF3R3K0000 RCILP0236BMZZ VP-NM3R3MR19N RCILP0105CEZZ RCILZ0599CEZZ RCILP0105CEZZ RCILP0104CEZZ RCILP0237BMZZ VP-CF3R3K0000 VP-CP3R3K0000 VP-CF4R7K0000 RCILP0223CEZZ RCILF0111BMZZ RCILP0110CEZZ RCILP0110CEZZ VP-CF1R0K0000 VP-CF1R0K0000 VP-NM3R3MR19N VP-NM100KR42N	10uH 10uH 47pH 145pH 10uH 3.3uH 3.3uH 3.3uH Delay Line Peak Coil Line Filter 1pH 1uH 3.3uH 10uH	AC AC AB AE AB AQ AB AQ AC AG AG AG AD AB AB AB AD AL AD AD AB AB AC AC
D0502	RH-EX0558BMZZ	S	Zener18V	AA						
D0504	RH-DX0533BMZZ	S	1N5819	AD						
D0505	RH-EX0561BMZZ	S	Zener 24V	AA						
D0506	RH-EX0561BMZZ	S	1N4934	AA						
D0507	RH-DX0528BMZZ	S	LL4148	AA						
D0508	RH-DX0551BMZZ	S	LL4148	AA						
D0509	RH-DX0551BMZZ	S	LL4148	AA						
D0510	RH-DX0551BMZZ	S	LL4148	AA						
D0511	RH-DX0551BMZZ	S	LL4148	AA						
D0512	RH-DX0528BMZZ	S	1N4934	AA						
D0513	RH-DX0501BMZZ	S	1N4004	AA						
D0514	RH-DX0551BMZZ	S	LL4148	AA						
D0601	RH-DX0529BMZZ	S	1N4935	AB						
D0602	RH-DX0551BMZZ	S	LL4148	AA						
D0603	RH-DX0551BMZZ	S	LL4148	AA						
D0604	RH-DX0530BMZZ	S	1N4936	AA						
D0605	RH-DX0299BMZZ	S	BY 228-20	AE						
D0606	RH-DX0301BMZZ	S	BY 299	AD						
D0607	RH-DX0529BMZZ	S	1N4935	AB						
D0608	RH-EX0550BMZZ	S	Zener 8.2V	AA						
D0609	RH-DX0527BMZZ	S	1N4933	AA						
D0610	RH-DX0528BMZZ	S	1N4934	AA						
D0611	RH-DX0551BMZZ	S	LL4148	AA						
D0614	RH-EX0545BMZZ	S	Zener5.1V	AA						
D0615	RH-DX0045BMZZ	S	1N4148	AA						
D0616	RH-DX0551BMZZ	S	LL4148	AA						
D0617	RH-EX0568BMZZ	S	Zener 47V	AA						
D0618	RH-EX0542BMZZ	S	Zener 3.9V	AA						
D0619	RH-EX0562BMZZ	S	Zener 27V	AA						
D0701	RH-DX0555BMZZ	S	RF2005	AB	CERAMIC FILTERS					
D0702	RH-DX0555BMZZ	S	RF2005	AB	CF 0301 CF1001 SF 0201	RFILC0118BMZZ RFILC0121GEZZ RFILC0112BMZZ	S S S	Filter Filter Saw Filter	AF AD AP	
D0703	RH-DX0555BMZZ	S	RF2005	AB						
D0704	RH-DX0555BMZZ	S	RF2005	AB						
D0705	RH-DX0539BMZZ	S	BYT52M	AC	TRANSFORMERS					
D0706	RH-DX0045BMZZ	S	1N4148	AA	A T 0601 A T0700	RTRNF2035BMZZ RTRNZ0546BMZZ	S S	F.B.T. Chopper	BC AQ	
D0707	RH-EX0409BMZZ	S	Zener BZX79C5.6V	AA						
D0708	RH-DX0561BMZZ	S	RGP15J	AD	CAPACITORS					
D0710	RH-DX0529BMZZ	S	1N4935	AB	C0225 C0236 C0237 C0313 C0323 C0333 C0335 C0340 C0349 C0350 C0351 C0401 C0404 C0421 C0422 C0502 C0508 C0514 C0524 C0601	VCEAGA1CW337M VCEAGA1CW227M VCCUTV1HJ6R8C VCEAGA1AW337M VCEAGA1AW337M RC-FZ9474BMNJ VCEAGA1AW337M RC-FZ9474BMNJ VCEAGA1EW107M VCEAGA1EW107M VCEAGA1AW337M RC-FZ9334BMNJ RC-FZ9334BMNJ RC-FZ9334BMNJ RC-FZ9334BMNJ RC-FZ9333BMNJ RC-FZ9104BMNJ RC-FZ9474BMNJ RC-FZ9684BMNJ RC-FZ0152BMZZ	S S S S S J J S S S J J J J J J J J J S	330 16VElectrolityc 220 16VElectrolityc 6.8p 50V SMD Ceramic 330 10V Electrolytic -830 10V Electrolytic 0.47 63V Mylar 330 10V Electrolytic 0.47 63V Mylar 10025V Electrolytic 100 25V Electrolytic 330 10V Electrolytic 0.33 63V Mylar 0.33 63V Mylar 0.33 63V Mylar 0.33 63V Mylar 0.1 63V Mylar 0.47 63V Mylar 0.68 63V Mylar 0.012 1,5kV Mylar	AC AC AA AB AB AD AB AD AB AB AB AC AC AC AC AB AB AD AD AE	
D0711	RH-DX0529BMZZ	S	1N4935	AB						
D0712	RH-DX0555BMZZ	S	RF2005	AB						
D0713	RH-DX0533BMZZ	S	1N5819	AD						
D0714	RH-EX0481BMZZ	S	Zener BZX79 B5.6V	AB						
D0715	RH-EX0545BMZZ	S	Zener TZMC5V1	AA						
D0716	RH-DX0551BMZZ	S	LL4148	AA						
D0717	RH-DX0551BMZZ	S	LL4148	AA						
D0718	RH-EX0482BMZZ	S	Zener BZX79 B6.2V	AA						
D0719	RH-EX0419BMZZ	S	ZenerBZX79C15V	AB						
D0720	RH-DX0529BMZZ	S	1N4935	AB						
D0721	RH-DX0045BMZZ	S	1N4148	AA						
D0722	RH-DX0551BMZZ	S	LL4148	AA						
D0724	RH-DX0559BMZZ	S	BAS12	AC						
D0725	RH-DX0559BMZZ	S	BAS12	AC						
D 0801	RH-EX0542BMZZ	S	Zener TZMC3.9V	AA						
D0802	RH-EX0545BMZZ	S	Zener TZMC5.1V	AA						
D0803	RH-DX0558BMZZ	S	BAV103	AA						
D0804	RH-DX0551BMZZ	S	LL4148	AA						
D0805	RH-EX0549BMZZ	S	Zener 7.5V	AA						
D0806	RH-DX0551BMZZ	S	LL4148	AA						
D0807	RH-EX0549BMZZ	S	Zener 7.5V	AA						
D0808	RH-EX0549BMZZ	S	Zener 7.5V	AA						
D 1001	RH-EX0549BMZZ	S	Zener 7.5V	AA						
D 1002	RH-EX0546BMZZ	S	Zener 5.6V	AA						
D1003	RH-EX0546BMZZ	S	Zener 5.6V	AA						
D 1051	RH-DX0551BMZZ	S	LL4148	AA						
D1101	RH-PX0102BMZZ	S	LEDSML010MT	AC						

REF. NO.	PART NO.	*	DESCRIPTION	CODE
CABINET PARTS				
1	CCABA1120BMVO	S	Front Cabinet 63CS-03SC	BK
1	CCABA1115BMVO	S	Front Cabinet 70CS-03SC	BQ
1-1	GDORF1045BMSA	S	Door	AE
1-2	GMADT1067BMSA	S	Window	AG
1-3	HBDGB3508BMSA	S	Badge SHARP (63CS-03SC)	AH
1-3	HBDGB3013MESA	S	Badge SHARP (70CS-03SC)	AG
1-4	HINDP5076BMSA	S	Indicator	AE
1-5	JBTN-1029BMSB	S	Push Button (Power)	AC
1-6	JBTN-1028BMSB	S	Push Button (Up-Down)	AC
2	GCABB1046BMKA	S	Rear Cabinet 63CS-03SC	BE
2	GCABB1045BMKA	S	Rear Cabinet 70CS-03SC	BE



SHARP SERVICE MANUAL

SEJWCSADJ////



GENERAL ADJUSTMENT PROCEDURES FOR

CS-CHASSIS

In the interests of user safety (required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be done by qualified service personnel only.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10 k ohm Resistor in series with an insulated wire (such as a test probe) between picture tube ground tag and high voltage lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely

BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, insulation resistor-capacity networks, mechanical insulators etc.

WICHTIGE SERVICE-HINWEISE

Wartung und Reparaturarbeiten an diesem Empfänger sollten nur von qualifizierten Kundendiensttechnikern ausgeführt werden.

WARTUNG DES HOCHSPANNUNGSSYSTEMS UND BILDROHRE

Bei Wartung des Hochspannungssystems leiten Sie dessen Statische Aufladung durch Zwischenschalten eines 10-Kiloohm-Widerstandes mit Hilfe eines isolierten Drahtes (wie z.B. einer Prüfsonde) zwischen die leitende Graphitschicht der Bildrohre und die 2. Anodenleitung ab. (Der Netzkabel-stecker sollte dabei aus der Netzsteckdose gezogen werden.)

1. Für die Bildrohre in diesem Empfänger wird ein integrierter Implosionsschutz verwendet.
2. Ersetzen Sie die Bildrohre durch eine Rohre mit derselben Typennummer, um eine dauernde Sicherheit zu gewährleisten.
3. Heben Sie die Bildrohre nicht am Hals hoch.
4. Fassen Sie die Bildrohre nur dann an, wenn Sie eine splitterfreie Schutzbrille tragen und nachdem Sie die Hochspannung vollkommen ableiten.

VON RÜCKGABE DES EMPFANGERS

Bevor der Empfänger an den kunden zurückgegeben wird, sollten Sie die folgenden Sicherheitsüberprüfungen vornehmen.

1. Überprüfen Sie sämtliche Leitungen, um sich zu vergewissern, daß diese nicht eingeklemmt sind, oder daß sich keine Kleinteile zwischen dem Chassis und anderen Metallteilen im Empfänger befinden.
2. Überprüfen Sie sämtliche Schutzvorrichtungen, wie z.B. die nichtmetallischen Reglerknöpfe, Isolierpapiere, Gehäuse- und Einstell- und Zwischenraumabdeckungen oder Abschirmungen, Isolierwiderstands-Kapazitätsnetzwerke, mechanische Isolatoren usw.

WARNING

The chassis in this receiver is partially hot, Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis.

To prevent electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service personnel.

WARNUNG

Das Chassis dieses Empfangsgerätes steht teilweise unter hohen Spannungen. Bei Wartungsarbeiten an diesem Chassis muß deshalb ein Isolationstransformator zwischen dem Netzkabelstecker und der Steckdose verwendet werden.

Um elektrische Schläge zu vermeiden, darf das Abdeckgehäuse nicht entfernt werden. Im Inneren des Gerätes befinden sich keine vom Benutzer einstellbaren Teile. Wartung und Reparaturarbeiten müssen qualifiziertem Service-Personal überlassen werden.

NOTES IMPORTANTES SUR L'ENTRETIEN

L'entretien et la réparation de ce récepteur doivent être uniquement effectués par un personnel de réparation qualifié.

REPARATION DU DISPOSITIF HAUTE-TENSION ET DU TUBE-IMAGE

Lors de la réparation du dispositif à haute tension, enlever la charge statique de l'appareil en branchant une résistance de 10 k ohms en série avec un fil isolé (comme une sonde d'essai) entre le film de graphite du tube et le deuxième conducteur d'anode. (Le cordon d'alimentation CA doit être débranché de la prise du secteur).

1. Le tube-image du récepteur utilise une **protection** intégrée anti-implosion.
2. Pour assurer la même sécurité, le remplacer par un tube du même numéro de type.
3. Ne pas lever le tube-image par son col.
4. Après avoir entièrement déchargé la haute tension, ne manipuler le tube-image qu'en portant des lunettes de protection incassables.

AVANT DE RESTITUER LE RECEPTEUR

Avant de restituer le récepteur à l'utilisateur, effectuer les vérifications de sécurité suivantes:

1. Vérifier tous les conducteurs pour s'assurer que les conducteurs ne sont pas pincés ou qu'il n'y a pas de pièce métallique introduite entre le châssis et les autres éléments métalliques du récepteur.
2. Vérifier tous les dispositifs de protection comme les boutons non-métalliques de commande, les pressphans d'isolation, les plaques arrière du coffret ou les blindages, les réseaux d'isolation résistance-capacité, les isolateurs mécaniques, etc.

NOTAS IMPORTANTES DE SERVICIO

El mantenimiento y la reparación de este receptor sólo debe realizarse por personal cualificado.

REPARACIONES DEL SISTEMA DE ALTA TENSION Y DEL TUBO DE IMAGEN

Cuando se repare el sistema de alta tensión, suprimir su carga estática conectando una resistencia de 10k ohmios en serie con un cable aislado (como una punta de prueba) entre la masa del tubo de imagen y el terminal de MAT. (El cable de conexión a la red debe estar desconectado).

- 1.- El tubo de imagen de este receptor emplea una protección integral contra la implosión.
- 2.- Substituir por **un tubo del mismo modelo para mantener la seguridad**.
- 3.- No levantar el tubo de imagen por el cuello (su parte estrecha).
- 4.- Después de descargar la alta tensión completamente, manipular el tubo de imagen usando gafas protectoras a prueba de impactos.

ANTES DE DEVOLVER EL RECEPTOR

Antes de devolver el receptor al usuario, efectúe las siguientes comprobaciones de seguridad.

- 1.- Inspeccionar los aislamientos de todos los cables para asegurarse de que ninguno está pellizcado o que no hay piezas metálicas en el chasis o en otras partes metálicas del receptor.
- 2.- Inspeccionar todos los dispositivos de protección como botones de control no metálicos, papeles hidrolizados aislantes, tapas posteriores, cubiertas de ajuste y comparimiento o blindajes, redes de aislamiento resistencia-capacidad, aisladores mecánicos, **etc.**

AVERTISSEMENT

Une partie du châssis n'est pas isolée du secteur. Utiliser un transformateur d'isolement secteur pour réparer ou manipuler. Utiliser seulement des pièces d'origine.

Pour éviter une décharge électrique, l'utilisateur ne doit pas retirer le DAS du téléviseur. Cette opération est du ressort exclusif d'un technicien qualifié.

ADVERTENCIA

Parte del chasis de este receptor no está aislado de la red. Usar transformador separador de la red al repararlo o manipularlo. Utilice solo recambios originales.

Para evitar una descarga eléctrica, el usuario no debe quitar la tapa. Encargue la reparación a personal cualificado.

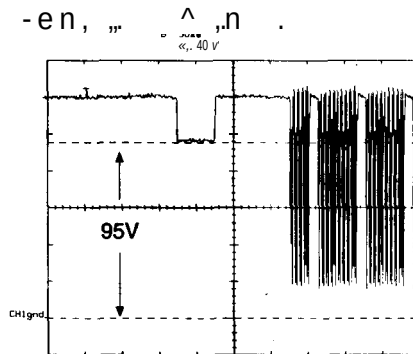
SERVICE ADJUSTMENTS

All the adjustments required for this chassis will be done in Service Mode, except G2.

G2 ADJUSTMENT

1. Receive cross hatch pattern signal.
2. Connect the oscilloscope to the red cathode and adjust G2 to read 95V on the sensor pulse as in below drawing:

NOTE:
Oscilloscope should be adjusted for vertical TV field trigger and synchronized with video signal.



In order to use the Service Mode

- Connect Test Pattern signal to antenna terminal.
 - Press main switch to OFF.
 - Press < and Ch^ buttons and main switch to ON simultaneously.
 - Service mode is now entered.
- To exit from service mode, press main switch to off.

The required adjustments can then be made from the Remote Control Unit.
The only buttons required are the following:

^Ch^ for movement in adjustment options menu; < are used to carry out an adjustment and POWER button to memorize or to start a new adjustment.

Adjustment menus are as follows:

- SERVICE SOFTWARE
- AGC TAKE OVER POINT
- HORIZONTAL SHIFT
- EAST-WEST WIDTH
- EAST-WEST PARABOLA
- EAST-WEST CORNER
- EAST-WEST TRAPEZOID
- VERTICAL SLOPE
- VERTICAL AMPLITUDE
- S CORRECTION
- VERTICAL SHIFT
- RED REFERENCE
- GREEN REFERENCE
- BLUE REFERENCE
- ALTER NVM POS
- ALTER NVM VAL
- IFPLLADJUSTAMENT
- TELETEX MIX MODE CONTRAST
- TELETEX CONTRAST
- OSD CONSTRAST
- AUTOINSTALLATION ON/OFF

Service Mode adjustments:

AGC TAKE OVER POINT

1. Receive colour bar signal (signal strength: 57dB/uV+/-1dB), the frequency should be chosen in the center of tuner band.
2. Press power button. The TV will perform an automatic adjustment.
3. To exit service mode turn off by main switch button on **tv**.

IF PLL ADJUSTMENT

1. Receive colour bar signal, CH69(855.25 MHz).
2. Press POWER button in remote control. The TV will perform an automatic adjustment.
3. Turn off by main switch to exit from service mode.

GEOMETRY ADJUSTMENT PROCEDURE:

The procedure for making adjustments to Vertical Corrections is as follows:

- Adjust VERT. SLOPE.
- Adjust S CORRECTION.
- Adjust VERT. SHIFT.
- Adjust VERT. AMPLITUDE.

The procedure for making adjustments to Horizontal Corrections is as follows:

- Set E-W WIDTH to minimum.
- Adjust HORIZONTAL SHIFT.
- Adjust E-W PARABOLA.
- Adjust E-W WIDTH.
- Adjust E-W TRAPEZOID.
- Adjust E-W CORNER.

VERTICAL SLOPE

- a) Receive center cross chart from pattern generator.
- b) Adjust horizontal line of the cross figure to coincide with the edge of the black area in the center of TRC. (fig. 1).

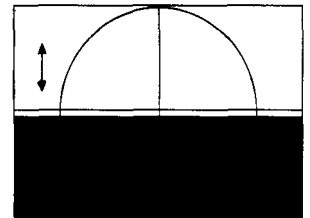


Fig. 1

HORIZONTAL SHIFT

- a) Receive Philips pattern signal.
- b) When volume-up button is pressed, picture moves to the left.
- c) When volume-down button is pressed, picture moves to the right.
- d) Adjust the horizontal location to obtain picture centering (fig. 2).

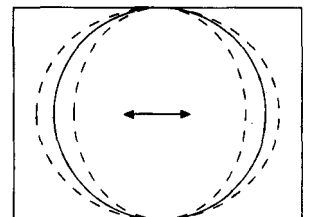


Fig. 2

E-W WIDTH

- a) Receive Philips pattern signal.
- b) When volume-up button is pressed, horizontal scanning increases.
- c) When volume-down button is pressed, horizontal scanning decreases.
- d) Adjust the horizontal amplitude to obtain 9% overscan (fig. 3).

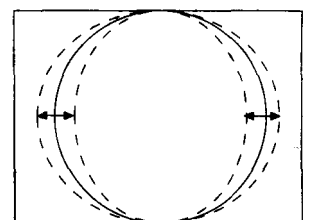


Fig. 3

E-W PARABOLA

- Receive Philips pattern signal.
- When volume-up button is pressed, side pincushion changes from pincushion shape.
- When volume-down button is pressed, side pincushion changes from barrel shape.
- Adjust the E-W PARABOLA to obtain condition as (fig. 4).

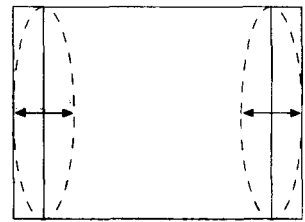


Fig. 4

E-W CORNER

- Receive Philips pattern signal.
- When volume-down button is pressed, side pincushion changes from pincushion shape.
- When volume-up button is pressed, side pincushion changes from barrel to pincushion shape.
- Adjust the E-W CORNER to obtain condition as in (fig. 5).

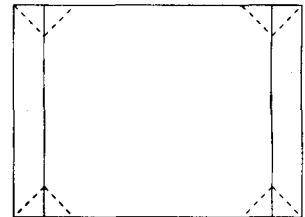


Fig. 5

E-W TRAPEZOID

- Receive Philips pattern signal.
- When volume-up button is pressed, side pincushion changes.
- When volume-down is pressed, side pincushion changes.
- Adjust the E-W TRAPEZOID to obtain condition as in (fig. 6).

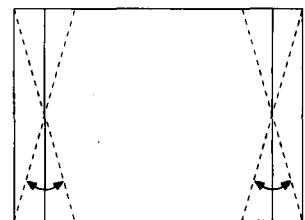


Fig. 6

VERTICAL SHIFT

- Receive Philips pattern signal.
- When volume-up button is pressed, picture moves down.
- When volume-down button is pressed, picture move **up**.
- Adjust the Vertical location to obtain picture centering (fig. 7).

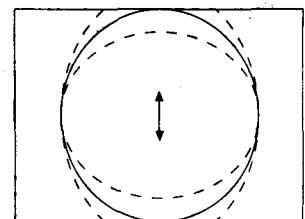


Fig. 7

VERTICAL AMPLITUDE

- Receive Philips pattern signal.
- When volume-up button is pressed, vertical size of picture increases.
- When volume-down button is pressed, vertical size of picture decreases.
- Adjust the vertical size to obtain overscan (fig. 8).

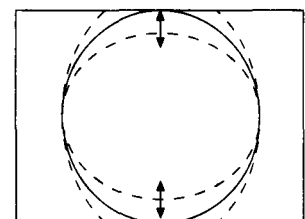


Fig. 8

S CORRECTION

- Receive Philips pattern signal.
- When volume-up button is pressed, upper and lower scanning decrease and centre scanning increases.
- When volume-down button is pressed, upper and lower scanning increase and centre scanning decreases.
- Adjust the S CORRECTION to obtain a balance between upper, lower and centre (fig. 9).

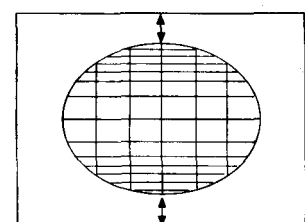


Fig. 9

COLOUR ADJUSTMENTS

The following adjustments are only required when Picture Tube is changed.

1. RED REFERENCE / GREEN REFERENCE / BLUE REFERENCE

1.1 Adjusts G2.

1.2 Tune a white card.

1.3 Adjust colour to minimum.

1.4 Place colourmeter in the center of screen.

1.5 Using brightness and contrast buttons, select a luminance of 120 NITS.

1.6 Operating in Service Mode select with ^H" the location RED REFERENCE, GREEN REFERENCE or BLUE REFERENCE and with ^V adjust to obtain the specific value of X and Y.

1.7 Exit Service Mode by switching off the MAIN POWER.

NOTE:

Red must not be modified.

Increase of GREEN will decrease "Y".

Increase of BLUE will decrease both "X" and "Y".

ACCESS TO NVM

Press Ch^ to move in the following sequence: "Y"

ALTER NVM POS

CH^

i

ALTER NVM VAL

To alter a valve press < v

CONTRAST ADJUSTMENT

^V is used to adjust the contrast of the following items, TELETEXT MIX MODE CONTRAST, TELETEXT CONTRAST and OSD CONTRAST.

AUTO INSTALLATION OFF/ON

When ON is selected the TV will perform the autoinstallation sequence as soon as service mode is removed.

REGLAGES DANS MODE DE SERVICE

Tous les réglages nécessaires dans ce chassis sont réalisés dans le "Service Mode» avec l'exception du réglage des G2.

REGLAGE G2

- 1) Syntoniser une mire «cross hatch».
- 2) Connecter l'oscilloscope au cathode rouge et après régler le Gil pour lire 95 V entre les deux niveaux A et B représentés au dessin,

NOTE

L'oscilloscope doit être réglé pour le trigger "vertical TV field" et synchronisé avec le signal de vidéo.

FONCTIONS DE "SERVICE MODE"

Pour entrer dans le "SERVICE MODE"

Appuyer simultanément sur < et CH-^ puis mettre l'interrupteur général sur marche. Il apparaîtra l'indication "SERVICE MODE" à l'image.

Pour sortir de "SERVICE MODE", arrêtez la télévision avec l'interrupteur général.

Vous pouvez faire tous les réglages avec votre télécommande.

Les seules touches suivantes seront nécessaires:

CH^ Pour vous déplacer entre le menu d'options de réglage
<v Sont utilisés pour réaliser le réglage, et la touche de mise en marche "POWER" pour mémoriser.

Les options de réglage sont les suivantes:

SERVICE SOFTWARE

AGC TAKE OVER POINT

HORIZONTAL SHIFT

EAST-WEST WIDTH

EAST-WEST CORNER

EAST-WEST PARABOLA

EAST-WEST TRAPEZOID

VERTICAL SLOPE

VERTICAL AMPLITUDE

S CORRECTION

VERTICAL SHIFT

RED REFERENCE

GREEN REFERENCE

BLUE REFERENCE

ALTER NVM POS

ALTER NVM VAL

IF PLL ADJUSTMENT

TELETEXT MIX MODE CONTRAST

TELETEXT CONTRAST
OSD CONTRAST
AUTOINSTALLATION ON/OFF

REGLAGES AVEC LE "SERVICE MODE»

AGC TAKE OVERT POINT

1. Syntoniser un signal de lignes de couleur (puissance du signal: 57dB/uV+/-1dB). La fréquence doit être sélectionnée au centre de la bande du tuner.
2. Appuyer sur la touche de mise en marche de la télécommande. L'appareil cherchera automatiquement son réglage de «AGC».
3. Pour sortir arrêtez la tv avec l'interrupteur général.

IF PLL ADJUSTMENT

1. Syntoniser un signal de lignes de couleur (channel 69—855.25Mhz).
2. Appuyer sur la touche de mise en marche "POWER" de la télécommande. L'appareil cherchera automatiquement son réglage.
3. Pour sortir arrêter la TV avec l'interrupteur général.

MANIERE DE FAIRE LES CORRECTIONS DE GEOMETRIES:

Procédure pour réglage **des corrections de Vertical:**

- Regler VERT. SLOPE.
- Regler S CORRECTION.
- Regler VERT. SHIFT.
- Regler VERT. AMPLITUDE.

Procédure pour réglage des corrections d'Horizontal:

- Mettre le réglage E-W WIDTH au minimum.
- Regler HORIZONTAL SHIFT.
- Regler E-W PARABOLA.
- Regler E-W WIDTH.
- Regler E-W TRAPEZOID.
- Regler E-W CORNER.

VERTICAL SLOPE

- a) Syntoniser une mire façon "center cross".
- b) Régler la ligne central horizontal de manière à coïncider avec la ligne supérieure de la surface noire (fig. 1).

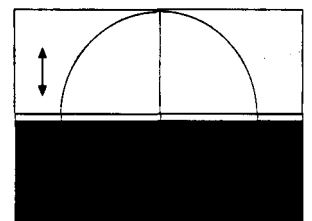


Fig. 1

HORIZONTAL SHIFT

- a) Syntoniser une mire façon Philips.
- b) Appuyer sur $\wedge$ l'image se déplacera à gauche.
- c) Appuyer sur $\wedge$ l'image se déplacera à droite.
- d) Régler la position horizontale pour une image située dans le centre (fig. 2).

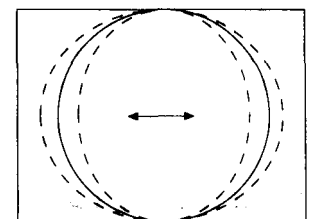


Fig. 2

E-W WIDTH

- a) Syntoniser une mire façon Philips.
- b) Appuyer sur $\wedge$ le balayage horizontal augmentera.
- c) Appuyer sur $\wedge$ le balayage horizontal diminuera.
- d) Régler l'amplitude horizontale pour obtenir un 9% de balayage (fig. 3).

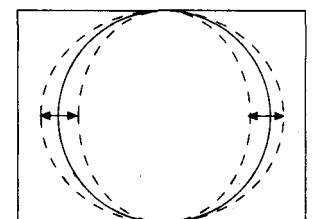


Fig. 3

E-W PARABOLA

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur $\wedge^A$, les cotes de l'ecran changeront d'efecte cousan a efecte tonneau.
- c) Appuyer sur $\underline{Y^1}$, les cotes de l'ecran changeront d'efecte tonneau a efecte cousan.
- d) Regler E-W PARABOLA pour obtenir le meme resultat que la (fig. 4).

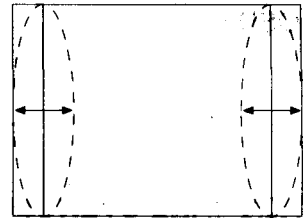


Fig. 4

E-W CORNER

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur $\wedge^A$, les cotes de l'ecran changeront d'efecte cousan a efecte tonneau.
- c) Appuyer sur $\underline{Y^1}$, les cotes de l'ecran changeront d'efecte tonneau a efecte cousan.
- d) Regler E-W CORNER pour obtenir le meme resultat que la (fig. 5).

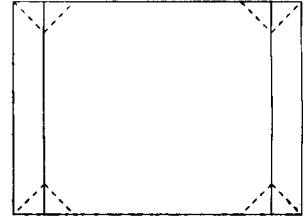


Fig. 5

E-W TRAPEZOID

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur $\underline{Y^1}$, les cotes de l'ecran changeront.
- c) Appuyer sur $\wedge^A$, les cotes de l'ecran changeront.
- d) Regler E-W TRAPEZOID pour obtenir le meme resultat que la (fig. 6).

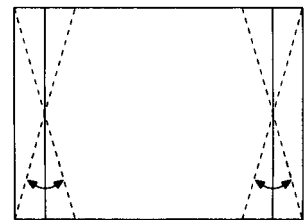


Fig. 6

VERTICAL SHIFT

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur $\wedge^A$, l'image descendra.
- c) Appuyer sur $\underline{Y^1}$, l'image montera.
- d) Regler la position vertical pour une imatge situee dans le centre (tig. 7).

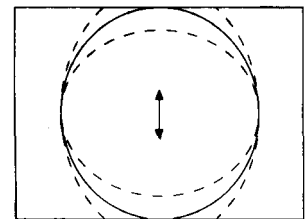


Fig. 7

VERTICAL AMPLITUDE

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur 1^A , la largeur vertical de l'ecran augmentera.
- c) Appuyer sur $\underline{Y^1}$, la largeur vertical de l'ecran diminuira.
- d) Regler la longueur vertical pour obtenir un balayage plus grand (fig. 8).

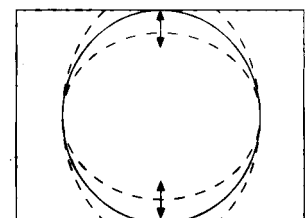


Fig. 8

S CORRECTION

- a) Syntoniser une mire facon Philips.
- b) Appuyer sur $\wedge^A$, le balayage superieur et inferieur diminuira et le balayage central augmentara.
- c) Appuyer sur $\wedge^A$, le balayage superieur et inferieur augmentera et le balayage central diminuira.
- d) Regler S CORRECTION pour obtenir une image symetrique referenciee au centre de l'ecran (fig. 9).

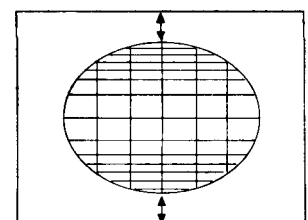


Fig. 9

REGLAGE DE LA COULEUR

Les reglages suivant sont necessaires uniquement quant les tube a ete change.

1. RED REFERENCE/GREEN REFERENCE/BLUE REFERENCE

- 1.1 Regler les G2
- 1.2 Recevoir une image blanche.
- 1.3 Regler la coleur au minimum.
- 1.4 Possitioner un colorimetre au centre de l'image.

- 1.5 Utiliser les boutons de lumière et de contraste pour avoir une luminosité de 120 NITS.
- 1.6 Entrer en mode service et sélectionner RED REFERENCE/GREEN REFERENCE/BLUE REFERENCE. Ajuster de manière à obtenir les valeurs de la spécification de X et Y.
- 1.7 Sortir du Mode service et contrôler les coordonnées de couleur X et Y de 20 et 120 NITS. Il sera peut-être nécessaire de répéter cette procédure.

NOTE

Il ne faut pas modifier le Rouge.

Les positions GREEN REFERENCE modifie la coordonnée Y.

BLUE REFERENCE modifie la coordonnée X et Y.

ACCES AU REGLAGE DE LA NVM

Appuyer sur CH⁷ pour faire apparaître la suivante séquence:

ALTER NVM POS

CH⁷



ALTER NVM VAL

Pour changer la valeur appuyer A^{^^}

REGLAGES DU CONTRAST

A¹V est utilisé pour régler le contraste du Teletexte et de l'OSD.

AUTOINSTALLATION OFF/ON

Si vous sélectionnez ON, l'appareil effectuera une séquence d'autoinstallation quand vous sortirez du SERVICE MODE.

SERVICE EINSTELLUNGEN

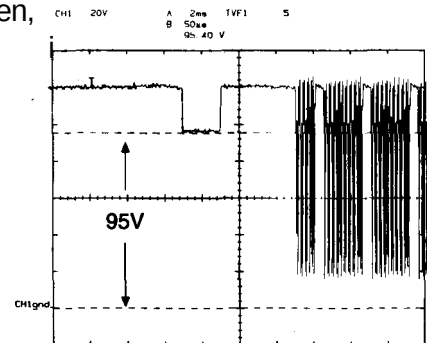
Alle erforderlichen Einstellungen für dieses Chassis werden im Service Modus vorgenommen. Ausnahme Q2.

G2 EINSTELLUNG

1. Gittermuster Signal erhalten.
2. Anschließen des Oszilloskops (Schwingungsmesser) an die rohe Kathode. Danach G2 einstellen, um 95V an dem Sensor Puls abzulesen, wie in der unten gezeigten Skizze erläutert.

BEMERKUNG

Das Oszilloskop sollte für das vertikale Fernsehbild eingestellt werden, um das Video Signal abzusenden und zu synchronisieren.



SERVICE MODUS FUNCTION

Benutzen des Service Modus

Das Gittermuster Signal an den Antennen Anschluß
Gerät ausschalten.

Die Knöpfe **^** und **Cr** drücken und gleichzeitig das Gerät wieder anstellen.
Jetzt befindet man sich im Service Modus.

Um den Service Mode wieder zu verlassen, bitte das Gerät ausschalten.

Die erforderlichen Einstellungen können an der Fernbedienung vorgenommen werden.

Die hierfür notwendigen Knöpfe sind:

^ um sich im Menü Options zu bewegen.

^ um Einstellungen durchzuführen.

Power-Taste Einstellungen um zu starten und zu speichern.

Das Einstellungsmenü ist wie folgt:

- SERVICE SOFTWARE
- AGC TAKE OVER POINT
- HORIZONTAL SHIFT
- EAST-WEST WIDTH
- EAST-WEST PARABOLA
- EAST-WEST CORNER
- EAST-WEST TRAPEZOID
- VERTICAL SLOPE
- VERTICAL AMPLITUDE
- S CORRECTION
- VERTICAL SHIFT
- RED REFERENCE
- GREEN REFERENCE
- ALTER NVM VAL
- IFPLLADJUSTMENT
- TELETEXT CONTRAST
- OSD CONTRAST
- AUTOINSTALLATION ON/OFF

Service Mode Einstellungen:

AGC EINSTELLUNG

- 1 Empfangen Sie ein Farbbalkensignal (signal starke 57 db/uV+/-1db) in der Mitte des Frequenzbandes.
- 2 Drücken Sie die Power-Taste auf der Fernbedienung. Das Gerät nimmt die Einstellung automatisch vor.
- 3 Um den Service Mode zu verlassen, das Gerät über den Netzschalter ausschalten.

IF PLL EINSTELLUNG

- 1 Empfangen Sie ein Farbbalkensignal: CH 69 (855.25 Mhz).
- 2 Drücken Sie die Power-Taste auf der Fernbedienung. Das Gerät nimmt die Einstellung automatisch vor.
- 3 Um den Service Mode zu verlassen, das Gerät über den Netzschalter ausschalten.

VERFAHRENSWEISE ZUR GEOMETRIE EINSTELLUNG:

Die Vorgehensweise, um vertikale Korrekturen vorzunehmen ist wie folgt:

- Einstellung der vertikalen Neigung.
- Einstellung der S-Korrektur.
- Einstellung der vertikalen Stellung.
- Einstellung der vertikalen Ausdehnung.

Die Vorgehensweise, um horizontale Korrekturen vorzunehmen ist wie folgt:

- 0/W-Breite auf Minimum setzen
- Einstellung der horizontalen Lage.
- Einstellung der 0/W-Parabel.
- Einstellung der 0/W-Breite.
- Einstellung der 0/W-Trapez.
- Einstellung der 0/W-Ecken.

VERTICAL SLOPE

- a) Empfangen Sie ein Gittermuster Ihres Bildmustergenerators.
- b) Stellen Sie das Gittermuster so ein, daß Sie die mittlere Linie des Gittermusters mit der oberen Kante der schwarzen Fläche in Deckung bringen. (Bei dieser Einstellung wird der untere Bildschirmbereich dunkel getastet) (Bild 1).

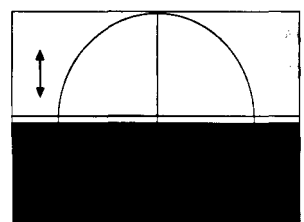


Bild 1

HOR. SHIFT

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drücken, so bewegt sich das Bild nach links.
- c) Wenn Sie den Lautstärke-Knopf (-) drücken, so bewegt sich das Bild nach rechts.
- d) Stellen Sie die horizontale Position so ein, daß eine Bildzentrierung erhalten (Bild 2).

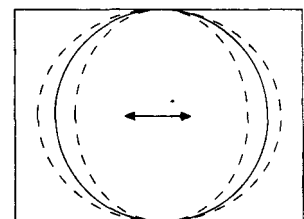


Bild 2

E-W WIDTH

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drücken, so vergrößert sich die horizontale Auslenkung.
- c) Wenn Sie den Lautstärke-Knopf (-) drücken, so verkleinert sich die horizontale Auslenkung.
- d) Stellen Sie die horizontale Amplitude so ein, daß eine Auslenkung (overscan) +9% erhalten (Bild 3).

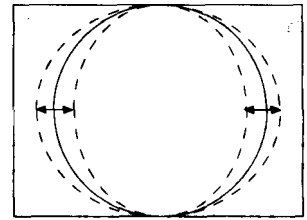


Bild 3

E-W PARABOLA

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drücken, so verändert sich die Punktierung beziehungsweise die Verzerrung von einer FaBform zu einer Punktierungs-oder Verzerrungsform.
- c) Wenn Sie den Lautstärke-Knopf (-) drücken, so verändert sich die seitliche Punktierung von einer FaBform zu einer Einschnurungsform.
- d) Stellen Sie E-W PARABOLA so ein, daß Sie eine Bedingung wie im Bild 4 erhalten.

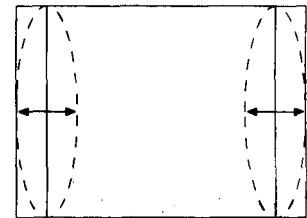


Bild 4

E-W CORNER

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf () drücken, so verändert sich die Punktierung beziehungsweise die Verzerrung von einer FaBform zureiner Punktierungs-oder Verzerrungsform.
- c) Wenn Sie den Lautstärke-Knopf (+) drücken, so verändert sich die seitliche Punktierung von einer FaBform zu einer Einschnurungsform.
- d) Stellen Sie E-W CORNER so ein, daß Sie eine Bedingung wie im Bild 5 erhalten.

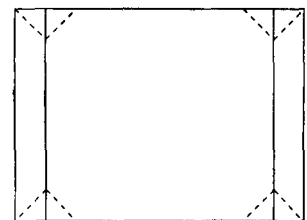


Bild 5

E-W TRAPEZOID

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drücken, so verändert sich die seitliche Abgrenzung.
- c) Wenn Sie den Lautstärke-Knopf (-) drücken, so verändert sich die seitliche Abgrenzung.
- d) Stellen Sie die E-W TRAPEZOID so ein, daß Sie eine bedingung erhalten wie es im Bild 6 erscheint.

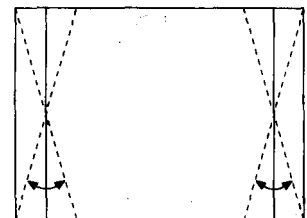


Bild 6

VERT. SHIFT

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den $\uparrow$ -Knopf drücken, so bewegt sich das Bild nach oben.
- c) Wenn Sie den $\downarrow$ -Knopf drücken, so bewegt sich das Bild nach unten.
- d) Stellen Sie die vertikale Position so ein, daß Sie eine Bildzentrierung erhalten (Bild 7).

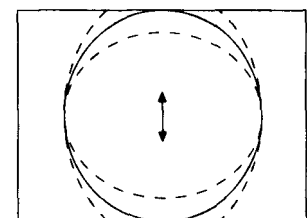


Bild 7

VERT. AMPLITUDE

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drücken, so vergrößert sich die vertikale Größe des Bildes.
- c) Wenn Sie den Lautstärke-Knopf (-) drücken, so verkleinert sich die vertikale Größe des Bildes.

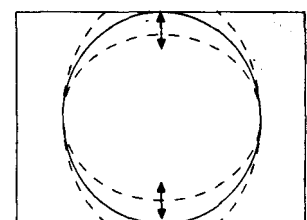


Bild 8

d) Stellen Sie die vertikale Bildgröße so ein, daß Sie eine Optimale Abtastung (overscan) erhalten (Bild 8).

S. CORRECTION

- a) Empfangen Sie das Philips-Test-Bild.
- b) Wenn Sie den Lautstärke-Knopf (+) drucken, so verringert sich die obere und die untere Abtastung und die Auslenkung in der Bildmitte wird vergrößert.
- c) Wenn Sie den Lautstärke-Knopf (-) drucken, so vergrößert sich die obere und die untere Auslenkung, die Auslenkung in der Bildmitte wird verringert.
- d) Stellen Sie die S-Korrektur so ein, daß Sie eine Ausgewogenheit zwischen dem oberen und unteren Bildteil und der Mitte erhalten (Bild 9).

FARBEINSTELLUNG

Die folgenden Einstellungen sind nur notwendig, wenn die Bildrohr gewechselt wurde.

1. ROT REFERENZ/GRÜN REFERENZ/ BLAU REFERENZ

- 1.1 Einstellung G2.
- 1.2 Empfang eines weißen Bildes.
- 1.3 Stellen Sie die Farbe auf minimum.
- 1.4 Stellen Sie den Farbmesser in die Mitte des Bildschirms.
- 1.5 Stellen Sie die Tasten Helligkeit und Kontrast so ein, daß eine Luminanz von 120 NITS erreicht wird.
- 1.6 Im Service-Mode wählen Sie mit den Tasten $\wedge CH \wedge$ die jeweilige Position RED REFERENCE Mit den Tasten $\wedge \wedge \wedge$ Stellen Sie wie folgt die Spezifischen Werte von X und Y.

BEMERKUNG

- Rot muß nicht geändert werden.
- Vergrößern von Grün, vergrößert Y.
- Vergrößern von Blau, verringert **X und Y**.

ZUGANG ZU NVM

- Drucken Sie CH um zu den entsprechenden Adressen zu kommen:
- Ändern der NVM Position

ChT

AJUSTES DE SERVICIO

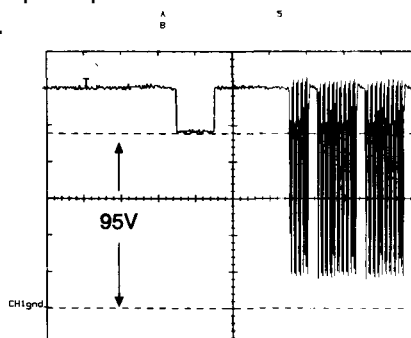
Todos los ajustes requeridos en este chasis seran realizados dentro del Modo Servicio excepto el ajuste de la **G2**

AJUSTE G2

1. Sintonizar una sehal tipo "cross hatch"
2. Conectar el osciloscopio al catodo rojo y ajuste la G2 para poder leer 95V sobre el pulso sensor tal como figura en el dibujo.

NOTA:

El osciloscopio debera sincronizarse con la serial de video y el trigger con los pulsos de vertical.



Para entrar en Modo Servicio:

- Conectar una sehal patron al terminal de la antena.
 - Apagar el televisor.
 - Apretar simultaneamente los botones ∇ y ∇ , Ch ∇ con los botones apretados encender el televisor.
 - Aparecera un indicativo informando que el televisor se encuentra en modo servicio.
- Para salir de modo servicio apagar el televisor con el interrupter general.

Todos los ajustes podran ser realizados desde el mando a distancia.

Los unicos botones necesarios seran:

∇ y ∇ para moverse entre el menu de opciones de ajuste; ∇ y ∇ son usados para realizar el ajuste y el boton de encendido para memorizar un nuevo valor.

Las opciones de ajuste son las siguientes:

- SERVICE SOFTWARE
- AGC TAKE OVER POINT
- HORIZONTAL SHIFT
- AST-WEST WIDTH
- EAST-WEST PARABOLA
- EAST-WEST CORNER
- EAST-WEST TRAPEZOID
- VERTICAL SLOPE
- VERTICAL AMPLITUDE
- S CORRECTION
- VERTICAL SHIFT
- RED REFERENCE
- GREEN REFERENCE
- BLUE REFERENCE
- ALTER NVM POS
- ALTER NVM VAL
- IF PLL ADJUSTMENT
- TELETEXT MIX MODE CONTRAST
- TELETEXT CONTRAST
- OSD CONTRAST
- AUTOINSTALLATION ON/OFF

Ajustes en modo servicio:

AGC TAKE OVER POINT

1. Sintonizar una carta con barras de color (potencia de la senal: 57dB/uV+/-1dB), canal 12 (224.25MHz).
2. Apretar el interruptor de encendido. El televisor realizara un ajuste automatico de CAG.
3. Para salir del modo servicio apretar el interruptor para apagar el televisor.

IF PLL ADJUSTMENT

1. Sintonizar una carta con barras de color, CH69 (855.25MHz).
2. Apretar el boton de encendido del mando a distancia. El televisor realizara un ajuste automatico.
3. Para salir del modo servicio apretar el interruptor para apagar el televisor.

PROCEDIMIENTO DE AJUSTE DE GEOMETRIAS:

El procedimiento para realizar las correcciones de Vertical son las siguientes:

- Ajustar VERT. SLOPE
- Ajustar S CORRECTION.
- Ajustar VERT. SHIFT.
- Ajustar VERT. AMPLITUDE.

El procedimiento para realizar las correcciones de Horizontal son las siguientes:

- Ajustar E-W WIDTH al minimo.
- Ajustar HORIZONTAL SHIFT.
- Ajustar E-W PARABOLA.
- Ajustar E-W WIDTH.
- Ajustar E-W TRAPEZOID.
- Ajustar **E-W CORNER.**

VERTICAL SLOPE

- a) Sintonizar una carta center cross.
- b) Ajustar la linea central horizontal **de la carta con el filo del area negra en el centro de la pantalla** (Fig. 1).

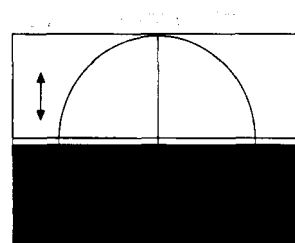


Fig. 1

HORIZONTAL SHIFT

- a) Sintonizar una carta Philips.
- b) Cuando $\wedge^m$ sea apretado, la imagen se despalzara hacia la izquierda.
- c) Cuando $\wedge^v$ sea apretado, la imagen se desplazara hacia la derecha.
- d) Ajustar la posicion horizontal para obtener una imagen centrada (Fig. 2).

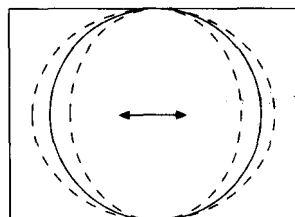


Fig. 2

E-W WIDTH

- a) Sintonizar una carta Philips.
- b) Cuando $\wedge^m$ sea apretado, el barrido horizontal incrementara.
- c) Cuando $\wedge^v$ sea apretado, el barrido horizontal disminuira.
- d) Ajustar la amplitud horizontal para obtener un 9% de sobre-escaneo (Fig. 3).

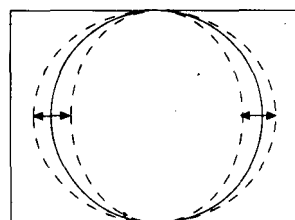


Fig. 3

E-W PARABOLA

- a) Sintonizar una carta Philips.
- b) Cuando $\sim^A$ sea apretado, los laterales de la pantalla cambian de efecto coji'n a efecto barril.
- c) Cuando $\wedge$ sea apretado, los laterales de la pantalla cambian de efecto barril a efecto coji'n.
- d) Ajustar E-W PARABOLA para obtener el mismo resultado que la Fig. 4.

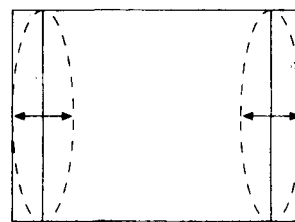


Fig. 4

E-W CORNER

- a) Sintonizar una carta Philips.
- b) Cuando $\sim^A$ sea apretado, los laterales de la pantalla cambian de efecto coji'n a efecto barril.
- c) Cuando $\sim^A$ sea apretado, los laterales de la pantalla cambian de efecto barril a efecto coji'n.
- d) Ajustar E-W CORNER para obtener el mismo resultado que la Fig. 5

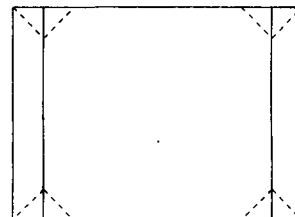


Fig. 5

E-W TRAPEZOID

- a) Sintonizar una carta Philips.
- b) Cuando $\sim^A$ sea apretado, los laterales de la pantalla cambian.
- c) Cuando $\sim^A$ sea apretado, los laterales de la pantalla cambian.
- d) Ajustar E-W TRAPEZOID para obtener el mismo resultado que la Fig. 6.

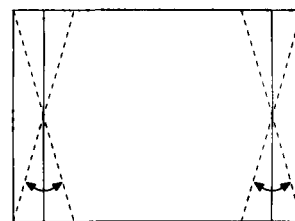


Fig. 6

VERTICAL SHIFT

- a) Sintonizar una carta Philips.
- b) Cuando $\sim^A$ sea apretado, la imagen se desplazara hacia abajo.
- c) Cuando $\sim^A$ sea apretado, la imagen se desplazara hacia arriba.
- d) Ajustar la posicion vertical para obtener una imagen centrada (Fig. 7).

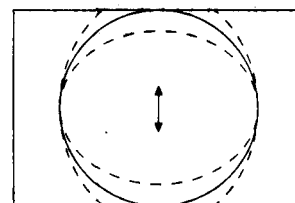


Fig. 7

VERTICAL AMPLITUDE

- a) Sintonizar una carta Philips.
- b) Cuando $\sim^A$ sea apretado, el tamaño vertical de la pantalla incrementara.
- c) Cuando $\sim^A$ sea apretado, el tamaño vertical de la pantalla disminuira.
- d) Ajustar el tamaño vertical para obtener un sobre-escaneo (Fig. 8).

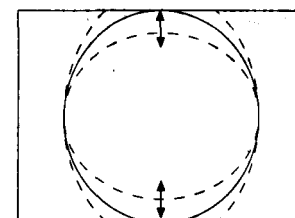


Fig. 8

S CORRECTION

- a) Sintonice una carta Philips.
- b) Cuando $\sim^A$ sea apretado, el barrido superior e inferior disminuira y el barrido central incrementara.
- c) Cuando $\sim^A$ sea apretado, el barrido superior e inferior incrementara y el barrido central disminuira.
- d) Ajustar S CORRECTION para obtener un punto medio entre la **parte superior**, inferior y central (Fig. 9).

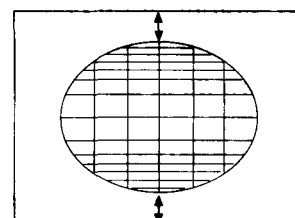


Fig. 9

AJUSTES DE COLOR

Estos ajustes solo seran necesarios en caso de cambio del tubo de imagen.

1. RED REFERENCE / GREEN REFERENCE / BLUE REFERENCE

1.1 Ajustar G2

1.2 Sintonizar una carta blanca.

- 1.3 Ajustar el color al mínimo.
- 1.4 Situar el colonmetro en el centro de la pantalla.
- 1.5 Usando los botones de brillo y contraste, seleccionar una luminancia de 120NITS.
- 1.6 En modo servicio seleccionar con $\wedge W$ RED REFERENCE, GREEN REFERENCE o BLUE REFERENCE y con $\wedge \vee$ ajustar para obtener los valores especificados de X e Y.
- 1.7 Para memorizar apretar el boton de encendido del mando a distancia.
- 1.8 Para salir del modo servicio apagar el televisor.

NOTA:

EL ROJO no debe modificarse.
Incrementando el VERDE, "Y" decrecera.
Incrementando el AZUL, "X" e "Y" decreceran.

ACCESO A NVM

Apretar $Cl\wedge$ para moverse en el siguiente orden:

ALTER NVM POS

$\wedge$

i

ALTER NVM VAL

Para alterar el valor apretar $\wedge \wedge \vee$

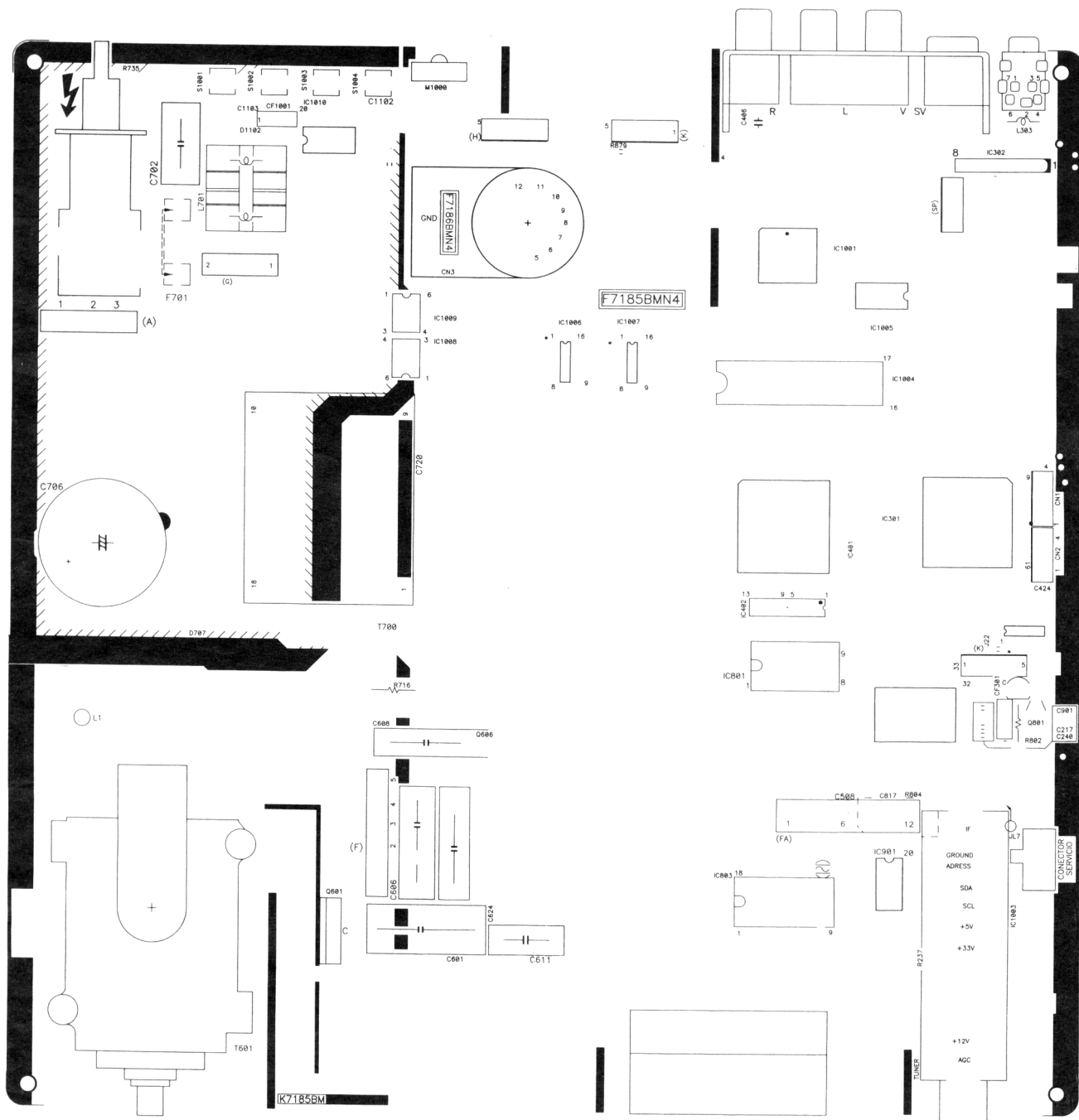
AJUSTES DE CONTRASTE

$\wedge \vee$ es usado para ajustar el contraste del Teletexto y OSD.

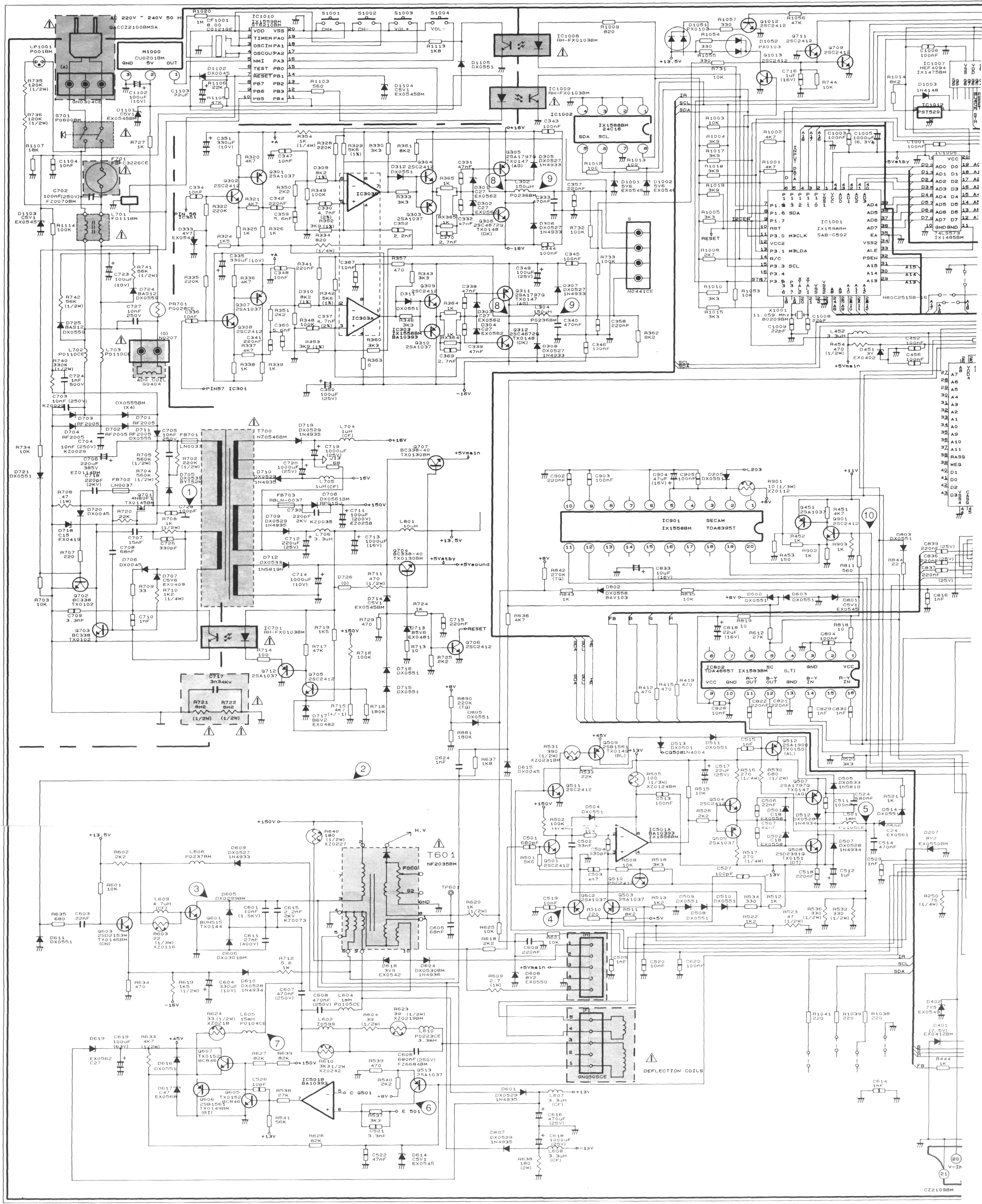
AUTO INSTALLATION OFF/ON

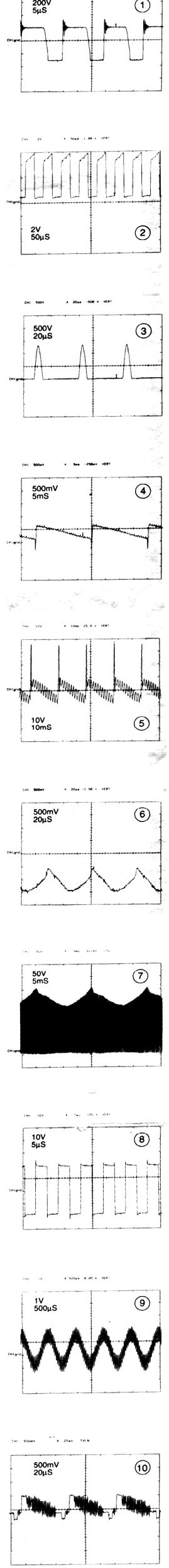
Cuando se selecciona ON en el TV se generara una secuencia de autoinstalaci6n una vez se saiga del modo servicio y se ponga en marcha el televisor.

CHASSIS LAYOUT



SCHEMATIC DIAGRAM





B-A / PWB-B

1	2	3
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6

2

